tarkan
the cantar mirror

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Aaton Cantar-X2

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Cantar / Internet

User Manual and Software download

Cantar, Majax and R.can-w manuals and tutorials are on http://www.soft.aaton.com/swcantar/ Latest Cantar software is accessible to registered owners only; beta versions are NOT to be used for commercial assignments.

• on your *first visit*: click 'create an account', enter your details, don't forget the country. After a few seconds you will receive an email with your password. Enter this password and your email address in the login page.

• on your *next visits*: If you forgot your password, click 'lost password'. Enter your email address; if it is found in the Cantar database, the password is sent to this address.

Cantar Users' Group

You can exchange tips and propose improvements on http://blake.aaton.com/mailman/listinfo/cantar-users

Pictures on the road

Send your pictures to aaton-support@aaton.com for the Cantar gallery, we will put the best ones on http://www.aaton.com/gallery/on-location

Post Production helper

Read the '**CantarPostChain**' and spread it around to Post. http://www.aaton.com/files/cantar-post-chain-22.pdf

Software versions

'–' all Cantars. '+' X2 only

v2.1x (March 2008) **–** Direct routing of all inputs to T7. **–** AUDIO/TC reshuffling. **+** Tarkan control through Ethernet.

v2.11 (Jan. 2008) **–** Creation of 'play-cards' with cue in/out for selective play of current and archive 'play-files'. **+** Rec&Play can play six tracks from internal or external HDD, add nine analog inputs while recording eight tracks on the internal HDD. **+** Remix for the dynamic mixdown of a prior recording with the addition of a commentary track. **+** ADR for 'hear it/say it' sessions. **+** Incremental Re-Recording.

v2.06 (Dec. 2007) **–** Talkback Mic going to Line-out and/or Foldback left (e.g. boom) or right (e.g. director). **–** Double beep at REC stop. **–** Two PDF Sound-Reports (ALL for 't p w a n' takes & WILD for 'w' takes). **–** ALE and CSV lists added to backups. **+** Up to 85ms delay on analog inputs; differential alignment and TC compensation. **+** Wordclock-sync at 48/96kHz (±0.1%) and 44.1kHz. **+** Autoslate detection on Mic1-5, Line-in1-4 and Track1-8.

v1.87/v2.00 (June 2007) **–** 'Remote Roll' recording starts upon receiving running LTC, and stops upon receiving frozen LTC from camera or GMT-u (no TC overlaps, no record interruption on RF transmission drop-outs). **–** Remote STOP, TEST, PPR and REC from CantaRem, R.can-w or keyboard. **–** Line-out & Foldback levels can be controlled by CantaRem sliders. **–** A new ALE/PDF page opens on each header item change. **–** Blank columns are allowed in the PDF Sound-Report. **–** In 'Forced' mode, CantaRem can put Cantar on STOP. **–** Archive tags are ticked after Backup@Call, they allow Cantar to finish filling a half full DVD-RAM. **–** IdleCopy is less prone to bus hangs with slow external HDDs (see LaCie firmware update p.41). **–** CSV file stored on internal HDD speeds-up PDF burning to DVD-RAM.

Note: in a Cantar-X1, v1.78 must have been installed once as the key to latest versions.

From Cantar-X1 to X2

X2 brings the following hardware improvements :

• a CM-5 motherboard carrying an FPGA (Field Programmable Gate Array) which provides increased processing power for functions which can't be performed by X1,

• an analog-to-digital converter (AD-5) with nine programmable audio delay buffers (up to 85ms @ 48kHz),

• a 100BaseT Ethernet interface board (ET-1) with an RJ45 socket in a hinged HDD holder.

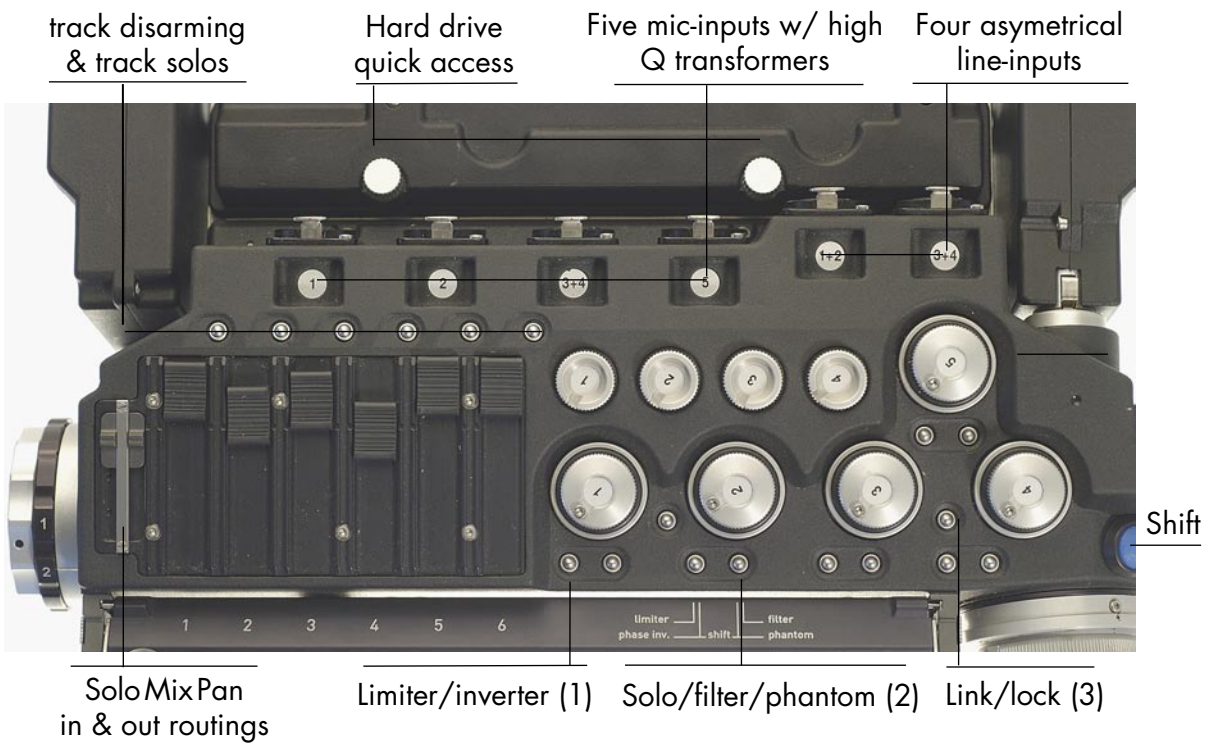
X1 and X2 both work under Aaton OS in the same low power consuming CPU, with the same software versions but some features require the capabilities of X2 to operate, e.g., Rec&Play; DVD-RAM playback; Ethernet connectivity; Differential delays on Mic & Line-in; AutoSlate detection on Mic, Line-in and Track; Wordclock sampling and synchronizing of multiple Cantars.

Note: a Cantar-X1 can be upgraded to a fully featured X2.

Permanently accessible faders

The Cantar interface is the easiest to use under the most technically demanding conditions:

• It offers the largest display surface of all portable recorders, which simultaneously shows every critical recording parameter.
• The custom designed high contrast displays remain viewable under bright light (sun, sand, sea, snow, storm), and at very low temperatures too.
• The swiveling front panel always provides the best viewing angle for both on cart and over the shoulder work.
• The large twelve position MainSelector eliminates diving into numerous sub-menus.
• The unique three-crown turret gives instant access to all recording and monitoring configurations, even while wearing heavy winter gloves.
• Nine rotary faders (analog inputs) plus six linear faders (mixdown), each entirely devoted to one specific task, are faster to handle than multi-function knobs.
• An important consideration for those who work in the desert or on the high seas, all of the mechanical actuators (faders, sliders, buttons, selectors) are sandproof and waterproof.



[**lim-inv**] (1) Limiter ON/OFF.
[**shift**] [**lim-inv**] Signal Inversion.

[**so-fil-tom**] (2) Solo & Filter. Balance access.
[**shift**] [**so-fil-tom**] Phantom 48V activation.

[**link-lock**] (3) Left (un)locks Mixer sliders
Right (un)locks Mic/Line faders.
[**shift**] [**link-lock**] Links Mic 1/2, Mic 3/4.

[Solo Mix **Pan**] pushed to the bAttery side:
·[**routing**] displays the inputs to *trAcks*.
·[**track-solo**] (end of slider button) shows *pAn-pots*.

[**Solo** Mix Pan] pulled to the Operator side:
·[**routing**] displays the outputs to *mOnitors*.
·[**track-solo**] (end of slider button) activates track *sOlo*.

Protected ins & outs

To complement the waterproof design, all audio sockets are pointed toward Earth, the same direction that rain falls. This concept has the notable side effect that no plugs protrude from the sides; this allows third party designers to build very narrow 'Made for Cantar' carts!

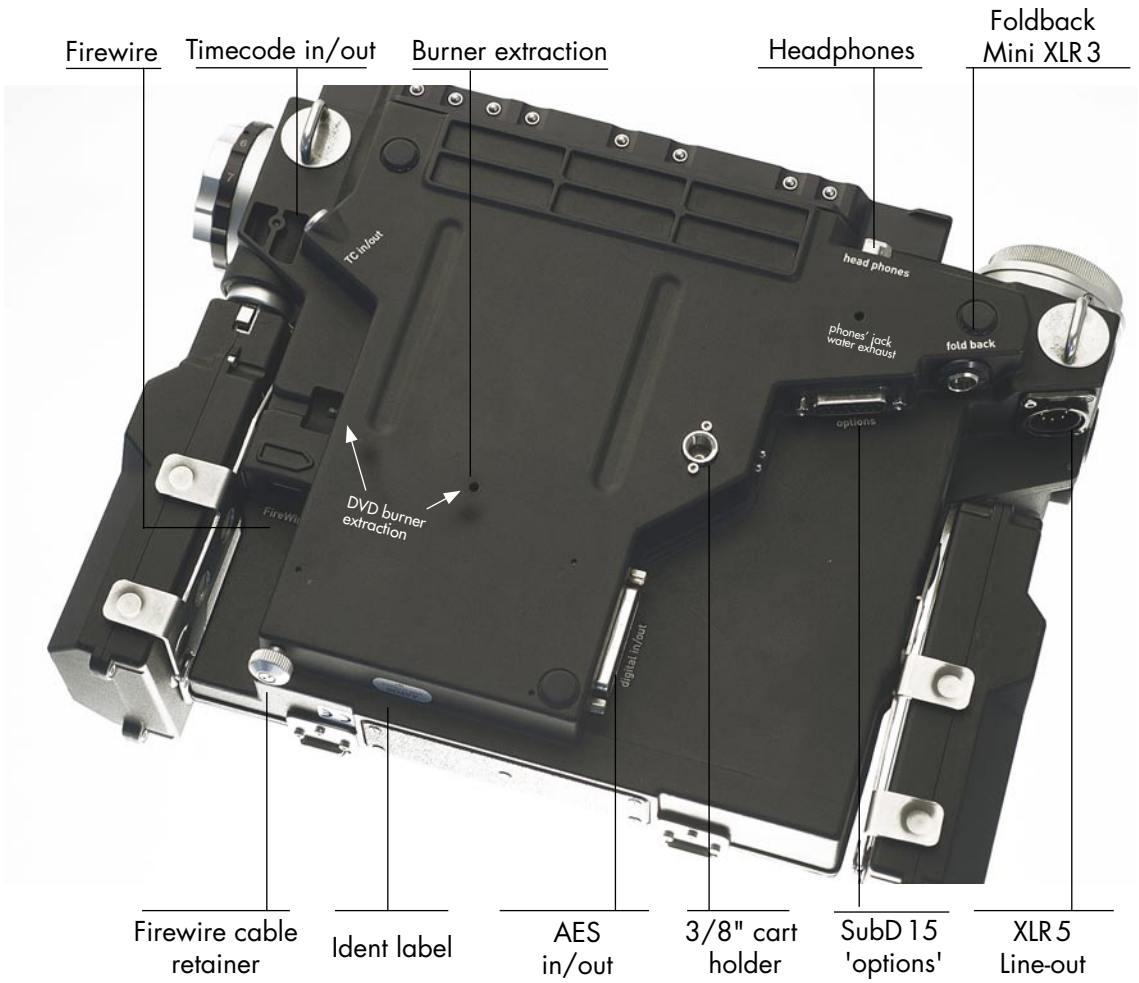
• The *SubD 15* (p.50) is used to connect CantaRem (p.46) or a USB-PS2 keyboard adapter .

• The *SubD 25* (p.50) is the AES in/out connector which can loop playback signals when in "REC&PLAY" mode.

• The *3/8" screw* is placed at the center of gravity between three rubber pads, and is used to secure the Cantar onto a cart.

•The *weep hole,* underneath the phone-jack socket, is a drainage port for water that has entered through the phone-jack.

•To *extract* the internal DVD/DVD-RAM burner, first remove its lateral retaining screw, then use a pencil or tooth pick in the DVD extractor hole to push the drive out of the Cantar housing (see the DVD burner extraction arrows on the picture below).



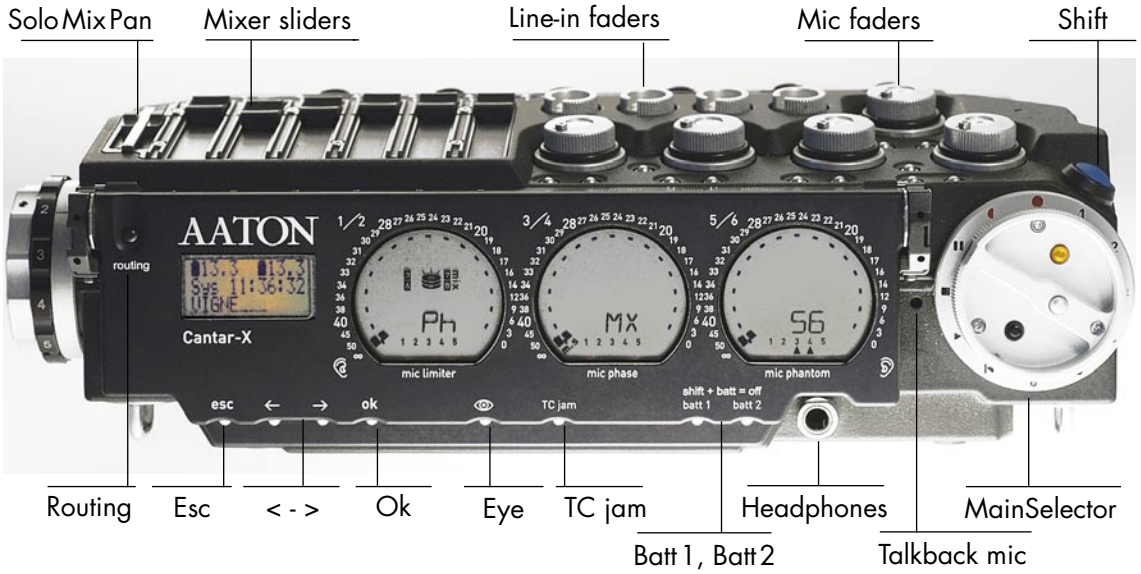
Please remember the following about the *FireWire* connection:

•• The *cable retainer screw* should be used at all times (use gaff-tape if your Cantar is not equipped with it) to avoid intermittent contact or sudden cable pull-out. A loose Firewire connection can induce 'bus hangs' and can even stop recording on both the external and internal disks.

•• DO NOT plug a cable into the Cantar Firewire socket while it is powered. The Firewire 6 socket that powers external disks and burners has a HOT 12V pin in it. If the plug enters at an angle, it will produce a short between the +12V pin and the in/out pins and DESTROY the Cantar Firewire driver. Please follow the HDD formatting instructions (p.35).

•• Only use *ferrite choke ring* equipped high quality Firewire cables.

Description 3,



Front panel buttons

[routing] [Solo Mix **Pan**] battery side: IN-GRIDS.
[routing] [**Solo** Mix Pan] operator side: OUT-MAPS.

[esc] pause/restart from there.
[shift] [esc] in PLAY, *continuous play of files toggle.*
in PPR, 'comment' line erasure.

[<] [>] prev/next play-card (p/n file if no card)
in 'Operands', other parameter value.
[shift] [<] [>] *prev/next play-file.*

[ok] start/stop playback; in 'Operands' push
focus to bottom row; value validation.
[shift] [ok] *digitization parameters and TC fps view.*

[eye] in 'Operatings', toggle T5/6 & T7/8
on right screen; in 'Operands', 'Help'.
[shift] [eye] *toggle rectangular screen bottom row:*
'filetag&duration' or 'scene&take'.

[TC jam] in PLAY, absolute TC; in TEST, a 3 sec.
pressure sets Sync clock to incoming LTC.
[shift] [TC jam] *in TEST, stops 'int c' reminder blinking.*

[batt-1(or2)] short pressure: battery voltage;
long pressure: battery on duty.
[shift] [batt] *in STOP, turns 'OFF' Cantar.*

Headphones

1/4" jack in an isolated compartment. The headphone amplifier is powerful enough to drive loudspeakers down to 8 ohms. The stored output level of the headphones is protected by the [shift] button.

Talkback mic

Nested near the MainSelector, the automatic gain talkback mic can be routed to Line-out, Foldback and tracks (p.10).

Circular and **Rectangular screens**

Always visible under the brightest light (p.7 & p.8).

TripleCrown and **MainSelector**

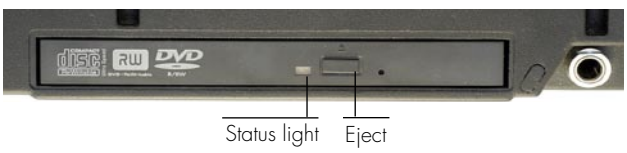
Easy to manipulate even with winter gloves on, they give access to all operating actions and operands (p.9, p.10 & p.25).

Mixer's faders

Dustproof and waterproof, they are magnetically driven. The black sliders can be easily replaced with colored ones.

DVD burner

The burner is protected by the swiveling front panel, to replace it see p.5, p.41 & p.50. The currently installed Matshita UJ-85J DVD-RAM /±R burner is a slot machine.



Circular screens

These are the largest, easiest-to-read screens found on any audio recorder. They provide the user with ongoing data concerning every aspect of the machine's operation while it is operating. It takes a few hours getting used to them since five display paradigms are used for the many functions they handle. Once you are familiar with these functions, you will drive the fastest machine you have ever driven.

• input grids. The six primary tracks graphically display their links at the push of a button, even while recording.

•• output maps. Thanks to the three screen lay-out emulating the left, both and right 'ears', the monitor maps are immediately understood.

••• progressive pan-pots. The contribution of each track to the mixdown has never been so clear.

•••• circular modulometers. Their round shape makes the signal level easy to appreciate in a wink.

••••• monitoring physical status. Permanent control of the disks, tracks, and setups.

• Input grids

The available 'Inputs' are shown in each circular screen: Line-in 1 to Line-in 4, Mic 1 to Mic 5, Digi 1 to Digi 6. The six tracks to which they can be connected are grouped in pairs, e.g. T1 T2, T3 T4, T5 T6 on the three screens.

The method of creating routing-configurations by linking inputs and tracks is explained in the section 'Routing inputs to tracks', p.26.

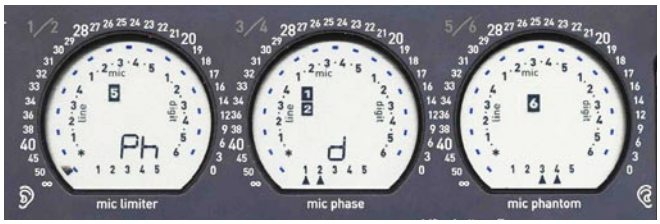
With the [Solo Mix **Pan**] slider pushed toward the battery, the [routing] button (top-left of the swiveling panel) instantly displays the 'inputs to tracks' grid, even while recording.

In the picture above the middle screen displays 'A4', the routing in use. Fifteen preset routing grids are stored in three banks. Each of which holds five grids, to help you sort and memorize your configurations, e.g. A1 to A5 for mic only setups, B1 to B5 when some line-inputs are on duty, C1 to C5 for complex setups that include digi-inputs. The [config] crown gives instant sequential access to all of them.

•• Output maps

Here is where Cantar's three screen 'mapping' is at its best. Audio signals going to the left ear show on the left screen, signals to be listened to in mono show on the middle screen and those going to the right ear are on the right screen.

All inputs *(recorded or not, very useful in Rec&Play)*, and all tracks can be monitored along different configurations for each of the eight independent outputs channels: **Ph** Phones, **Lo** Line-out, **Fb** Foldback and **Do** Digital-out. 26 different 'output routing' maps are available; the black [monitor] crown gives instant access to all of them, see p.28.

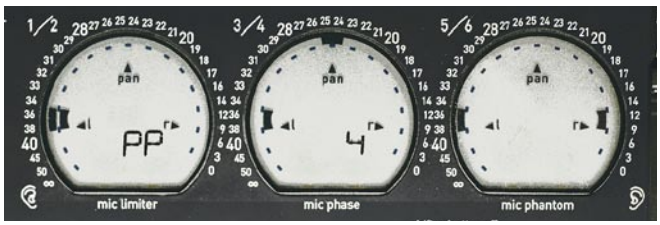


In the example above, the 'Ph d' phone routing indicates: Track 5 goes to the left ear, Track 1 and Track 2 go to the center (both ears) and Track 6 goes to the right ear. With the [**Solo** Mix Pan] slider pulled toward the operator side, pressure on the [routing] button instantly displays the current monitor configuration.

Note: the [routing] button is required to change from one grid to another, it is a protection against wild and lethal changes, but it is not required to change from one map to another in the course of a recording.

••• Pan-pots to the mixdown

Push the [Solo Mix **Pan**] slider toward the battery side, press the [track-solo] button next to the mixer linear fader: the pan-pot of this track goes under [jog] control and indicates its left/right contribution to either channel of the mixdown.



T1 & T2 left T3 center, T4 left T5 left, T6 right

The spatial position of all pan-pots is visible on the circular screens while the dBFS value of the selected pan-pot is displayed in the rectangular screen (see next page).

•••• Circular modulometers

Cantar's large circular modulometers, visible under the brightest light as well as in the dark, are the most accurate metering tools found in any portable recorder. They feature a non-linear scale with increased resolution (1dB) in the most important range: -55 to -40dBFS (5dB per segment); -40 to -32dBFS (2dB / segment); -32 to -12dBFS (1dB / segment); -12 to 0dBFS (3dB / segment).
The peak level segment hold duration is adjustable from 0.5 to 5 seconds (see AUDIO/TC.10).
The Tracks are grouped into 'natural' pairs: T1 T2, T3 T4, T5 T6. When a track is momentarily dis-armed, its modulometer appears dashed.

••••• Monitoring physical status

The center of each circular screen continually displays the status of the main recording elements:

• activity of the internal HDD ('three-platter' icon on the left screen), the external HDD ('three-platter' icon on the middle screen), and the DVD ('one-platter' icon on the right screen). Disk activity is highlighted by the presence of the track IDs recorded on it.

left screen
Internal HDD

middle screen
External HDD

right screen
CD/DVD

• sync clock mode: either master **int c** or slave **ext c**.

• mic preamplifier status: Limiter on/off, Direct/Invert, Phantom on/off.

• the current monitor map name (sent to the phones too) is constantly displayed by large alphanumeric characters.

• the activation of the *mixdown recording* on T7 T8 is indicated by the '**mix**' icon next to the '7' and '8' black squares.

Note: the screens are visible in very bright sunlight, to save backlight power, see TECHSET.02 'Backlight' (p.32).

Rectangular screen

• 'Operating' functions control (p.10)

```
V16.2  V14.8
Sys 12:45:22
2007-11-24
```

In STOP
top row: batt 1 & batt 2 voltage
middle row: system time
bottom row: system date.

In TEST or REC
top row: tracks T7 T8 modulometers. With [jog], battery voltage, available recording time, and remaining disk space. The [eye] button toggles display of tracks T5 T6 or T7 T8 on the right modulometer.
middle row: the source and the TC stamped in the audio files: '**Atc**' (ASCII-TC), '**Ltc**' (jam from LTC), '**Stc**' (from the system calendar), '**Otc**' (operator entered TC), '**Rtc**' (Record-Run TC), and '**Etc**' (slaved to an external clock).
bottom row: (in TEST) current project name; (in REC) 'filetag & duration' or 'scene & take' by [shift] [eye]. While adjusting a pan-pot, the track rank, plus the maximum gain value of the whole mixer panel (0dB or +6dB) are displayed.

```
NEXT  AX0490
Seq  Sc  Tk
121R/a12 t06
```

In PPR or BROWSE
scene, take, track-names, comments, Sound-Roll/Shoot Day, for their editing (p.18 & p.24).

```
00:14Ⅲ00:15
10% 18:38:05
CC2165 01:32
```

In PLAY
player's position, cue points, 'filetag & duration' or 'scene & take' by [shift] [eye] (p.23).

•• 'Operands' functions control (p.25)

In AUDIO/TC, TECHSET, SESSION and BACKUP, the pathtree of each parameter is displayed.

```
AUDIO/TC  01
SampleRate
48048
```

top row: the 'Operand', e.g. AUDIO/TC.
middle row: parameter name, e.g. SampleRate.
bottom row: parameter value, e.g. 48048.

Description 6.

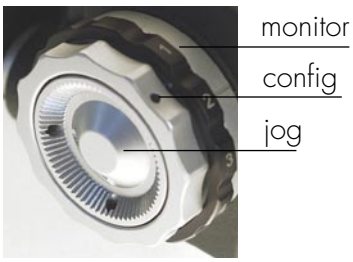
Triple crown

The large all weather triple crown is used to verify and select the input routings and monitor maps with only one hand.

Monitor Crown

1 So Mic, Line-in and Digi-inputs, plus active tracks are directly selected and sent to the headphones as 'solos'.
2 Ph Mixer output and seventeen user configurable maps (A to Q) to headphones.
3 Lo Mixer output and nine user configurable maps (R–Z) to dual Line-out (XLR 5).
4 Fb Mixer output and nine user configurable maps (R to Z) to dual foldback out (mini XLR 3).
5 Do Mixer and nine user configurable maps (R to Z) to Digi-out on AES7&8.
Note: the headphones also receive the signal sent to the output being configured.

Config Crown



- [Solo Mix **Pan**] slider pushed toward the battery, the [routing] button displays the IN-GRIDS configs on the three circular screens.
- [**Solo** Mix Pan] slider pulled toward the operator, the [routing] button displays the OUT-MAPS on the three circular screens. These screens respectively become left, both and right ears.

In REC, since the OUT-MAPS checking has no interaction with the ongoing recording, it is possible to select another map for any of the available outputs with the [config] crown.

In TEST and PPR, the [config] crown browses the IN-GRIDS (inputs-to-tracks routing) and selects the one shown when the [routing] button is released.
In REC, the grids can be checked but not mistakenly changed, see 'T1–T6 routing check and modify', p.27.

Jog Crown

The 'one finger' [jog] is used to move the cursor in the routing circular screens, to edit the scene and take, to select high pass filters, to adjust the backlight's intensity, to control the pan-pots, and to scrub the player in fast forward/reverse.
Note1: [shift] [jog] accelerates the [jog] speed 10x.
Note2: the Operand's middle and bottom rows of the rectangular screen can be browsed by the [>] and [<] arrows just as easily as with the [jog].

Operating positions.

MainSelector West positions

The MainSelector is easy to manipulate even while wearing heavy winter gloves; it gives direct access to all essential functions.

The six **OPERATING** (West) positions control the recording, annotation and playback of audio files. To get access to the Rec&Play BLUE-XX positions, press and hold the blue [shift] button while rotating the [MainSelector], see p.44.

(The six OPERAND (East) positions, which establish Cantar's operating parameters, are described on p.25).

Std. pos.		*Blue pos.*
REC	●	BLUE-REC
PPR	(	
TEST	II	BLUE-TEST
STOP	■	
PLAY	>	BLUE-PLAY
BROWSE	K	BLUE-BRWS

MainSelector buttons

[**black**], [**silver**] and [**red**]* buttons can be activated by the thumb, while the blue [shift] button may be pressed by the index-finger.

[silver]	in REC, insert a marker on-the-fly.
	in PLAY, go to operator record marker.
[shift] [silver]	in REC, trigger AutoSlate detection.
	in PPR, toggle take editor (PREV/NEXT take).
	in TEST, open input delay settings.
	in PLAY go to AutoSlate marker.
[black]	in REC, PPR, TEST, talkback mic activation**.
	in PLAY, inserts a play mark.
	in BLUE-PLAY, inserts a cue-in.
	in IN-GRIDS, links an input to a track.
	in OUT-MAPS, connects audio sources to outputs.
[shift] [black]	in REC, PPR, TEST talkback mic to active tracks.
	in PLAY, plays from start of take.
[red]	in REC, PPR, BROWSE, changes take-type.
	in BLUE-PLAY, inserts a cue-out.
	in IN-GRIDS, unlinks an input from a track.
	in OUT-MAPS, disconnects sources from outputs.
[shift] [red]	in TEST, PPR,REC, 1kHz reference tone:
	'Off' at [red] release, remains 'On' if [shift]
	released first, press [shift] to turn 'Off'.
	in BLUE-PLAY, hide play-card from Rec&Play list.

* The red button may appear red/gold

**Audio/TC.04, p.30

Starting & Stopping

To turn 'ON' Cantar, set the [MainSelector] to STOP, press the [batt 1] or [batt 2] button for a couple of seconds. The rectangular screen lights up to confirm that Cantar is powered. On the left circular screen, the 'three-platter' icon blinks for 3 to 5 seconds, the time it takes the disk to wake up; it is surrounded by the icons of the currently routed tracks. The rectangular screen displays batt 1 and batt 2 voltages, plus the system day and time.

To shut down Cantar, set the [MainSelector] to STOP, maintain pressure on the blue [shift] button and [batt 1] or [batt 2] until 'AU REVOIR' is displayed. As a safety measure, if you are not in STOP, nothing happens.

Reminder: while in STOP, internal HDD sleeping, the current drain is a mere 270mA. To keep the internal sync-clock running, do NOT turn 'OFF' Cantar during the workday.

Twin battery safety

Cantar's low power consumption electronics offer the longest operating time of all portable eight track audio recorders. With a single set of on-board Li-Ion batteries, the eighteen hour Cantar outperforms all other recorders. And with the twin battery system you will never be taken by surprise. *While working on a cart from a mains power supply, leave a battery onboard and activate both inputs:* the battery will buffer possible mains power problems or the power cord being accidently disconnected. To avoid charging spikes, the battery which remains on-board is not charged, just not discharged while Cantar is connected to mains power.

Mains power supply

Only use a low ripple, 14V max, power supply able to sustain a 4A surge at Cantar's start-up. If it is not able to deliver the surge current, plug a NiMH (12V) battery on one side and connect the power supply (14v) to the other. Activate both inputs: the battery will supply the surge and then will be off duty thanks to the power supply higher voltage. NEVER use a battery charger, its idle voltage can go up to 24V; a Cantar killer.

Minimum voltage

When the active battery voltage drops 300mv below the operator entered Batt Alert level, both inputs are put on-duty. This allows the simultaneous use of a 12.5V NiMH battery with alert level set to 10.5V, and a 14.4V Li-Ion battery with alert level set to 12.4V (see TECHSET.11-12, p.32).

When the alert level is reached, a two beep alarm goes to the headphones; the rectangular screen displays BATT LEFT LOW or BATT RIGHT LOW. While in REC, both batteries are automatically put on duty, in case you unplug one by mistake.

Maximum voltage

16.6V is the maximum voltage which can be applied to Cantar, including the Firewire socket; no problem with Mac laptops and PCs, they deliver a safe 12V. *Never connect MAC G3/5 desktops delivering 30V on the Firewire socket,* extract the HDD from Cantar and connect it directly to the Gs (it can sustain up to 40V).

Battery check

In TEST, [jog] to display the battery voltage. It also appears in all positions whenever you press the [batt 1] or [batt 2] button. Pressing a battery button for more than two seconds puts the battery on-duty.

Power Consumption

STOP: 270mA (sleep mode), 420mA (HDD running)
TEST: 600mA (AES Off, Phantom Off, Heater Off)
REC: 650mA (AES Off, Phantom Off, Heater Off)
AES 'ON': + 100mA
Phantom 'ON': + 10 to 20mA per mic (60mA total)
Heater 'ON': + 500mA (until reaching +4°C under screens)
Ethernet 'ON': + 50mA.

Lithium-Ion batteries

An Aaton R-Cell Li-Ion batteries are 30% more powerful than the same size NiMH, and lighter too: 560gr vs. 695gr.

Charge: to avoid destruction by NiMH chargers, they are charged through the XLR4 pin-3 and protected by an 80V reverse voltage diode on pin-4. *LED status: red/orange = two hour fast charge to 85% capacity, amber = three hour top-up, green = charged. Always turn 'OFF' the 'Mascott 9940 Li 4-cell, 2A @14.4V' for 4sec. before connecting a battery.*

Supply: the +Batt. current is either flowing through the diode-protected pin-4 or directly through pin-3 to Cantars over #268 having their XLR4 socket pin-3&4 tied together.

Project, Day & Files

Error-free filing with NO disk partitioning!

When you cold-start Cantar, it assumes you want to continue working on your latest project, which is displayed at the bottom of the rectangular screen.

When you rent a Cantar, its project memory should be empty; the rectangular screen should display 'No Project'.

Once created, a 'project name' regroups all data related to it, such as the days of recording, the tracks and the disks used. This name is stored in each audio file, there is no risk of a file getting lost in a maze of terabytes.

Unlike other machines, the Cantar file sorting system doesn't rely on disk partitions. Instead, it uses the *'Project/Work Day/Filetag'* path tree, which allows for the intuitive and safe retrieval of any audio file on unpartitioned disks, anywhere along the Post chain. It is ***not*** operator-error prone.

1. Project

If you are in a bind and have no time to select a project in SESSION.01 'ProjectName' (p.35), go directly to REC, your audio files will be stored in a project named AACANTAR. Later, with Majax you will move these audio files out of the 'AACANTAR' folder and into the project directory you would have created in the mean time.

Note: in their iXML chunk, the moved files still hold 'AACANTAR' as the Project Name. You will need to manually replace that provisional name with the correct name.

2. WorkDay

At startup Cantar displays '**New Workday?**' giving you the opportunity to say 'NO'. Note that going to TEST or REC is a way to say 'YES'.

```
New Workday?
No = [esc]
Yes = [ok]
```

The 'workday' is not the same as the actual 'time-of-day' as defined by the sync clocks, it is an interpretation of the 'human' day (see next page).

```
v13.5  V13.9
Sys 12:29:14
2005-03-22
```

The Cantar recorded files are multi-monophonic, i.e. independent files stored in a 'workday folder'. That folder is automatically created at the start of each day and is named for the date, e.g. 20041206.AAD (see 'Calender Time', p.13).

Because original multi-monophonic files sometimes have to be interleaved into large polyphonic files for crippled editing machines, Cantar also builds an .AAP suffixed 'shadow folder' which stores the associated polyphonic files for the day, e.g. 20041206.AAP.

3. Filename

In 1997, the Aaton Indaw multitrack digital recorder introduced the Aaton filename system. Each filename consists of: a unique machine generated *filetag*; an optional *descriptor* that displays the scene, take-type and take; a *suffix* that indicates the type and sequence of the file.

The aim is to perform these tasks while remaining compatible with EDL standards which only handle '8+3' DOS filenames, and with Mac OS9 which is limited to 31 characters.

- The automatically incremented six character ***filetag*** (AD1234), differentiates 6.7 million takes, a sound mixer's lifetime! (Indaw generates a 3 letter and 3 number filetag for 17.6 million takes). The filetag must remain untouched all the way through the final mix. One filetag represents a complete 'file group', e.g. AD1234 is the unique filetag of eight monophonic files from AD1234_1 to AD1234_8 and of its associated polyphonic file, e.g. AD1234PR.
- The ***descriptor*** displays the scene, take-type, and take #, e.g. scene A18:2a, take-type t, take 04.
- The ***suffix*** is used to flag the nature of the file, either multi-monophonic (_1 .. _8), or interleaved poly-Native (PN), or interleaved poly-Rotate (PR), or poly miXdown (PX).

See 'Cantar Post Chain' http://www.aaton.com/files/cantar-post-chain-22.pdf

Filename examples

A short filename: AD1234_1.wav

A long filename: AD1234==A18:2a t04==_1.wav

A questionable file?

Ask Aaton to give you access to their file-repair FTP site. If you don't have an ftp client, download the excellent 'Cyberduck' freeware from http://cyberduck.ch/

An operational problem?

Go to TECHSET.16 'Save Setup', and create a Setup file to be e-mailed to cantar-support@aaton.com, this will help them solve your problem.

Calendar and Sync Times

Time is the essence of a digital audio recorder. Cantar uses two kinds of time: '**Calendar Time**' organizes folders and files, '**Sync Time**' links audio and picture.

Calendar Time

System date and ***time*** run on a medium precision clock which automatically creates the workday folders. This clock is powered for four to six years by a user replaceable 3V Lithium CR1220 button battery located below the HDD compartment.

In STOP, the system date and time displayed on the rectangular screen must be checked for a ±5 minute consistency with the time-zone you are working in; think of it when you get off of a three-hour flight.

This clock is very important for the file management; go to TECHSET.20 'System Time' and press [ok], a triangle points to the modifiable digit. Using [jog], select the desired value, then press the [>] or [<] to move on to the next column, and so on, [ok] to exit. *Power 'Off' then 'On' Cantar for the CPU to acknowledge the new system time.*

The ***Workday*** is related to the date defined by the calendar clock but not totally a clone of it. The workday is an interpretation of the 'human' day; its duration can be from 6 AM in the morning to 3 AM in the deep night next day. If you turn 'OFF' the batteries after midnight, Cantar thinks the operator has gone to sleep. But if your 'workday' is continued into the wee hours after a midnight snack, you would probably not want it to be considered a 'new' workday. That is why Cantar displays '**New Workday?**', giving you the opportunity to say 'NO'. Note that going to TEST or REC is a way to say 'YES'.

Thus, if you stop working at 2 AM one day, the audio files are technically still part of the previous workday. Conversely if you want to start a new workday right after midnight, just turn 'OFF' Cantar, then turn it back 'ON' and answer 'YES' or go to TEST.

Sync Time

At startup you will notice a blinking **int c** or **ext c** icon, depending upon the master (internal clock) or slave (external clock) mode selected in AUDIO/TC.14 'TC Source'. This blinking icon reminds you to verify that the same timecode is running in all of the camera(s) and audio recorder(s).

Four syncing methods can be used:

Method 1
'int c' internal ***Free-Run*** master-clock

Set AUDIO/TC.14 'TC Source' to '**Int.Clock**'. The internal TCXO 1 ppm clock keeps the time accurate to within ±one frame in nine hours; this time is used to stamp the sound files with the very same TC as the one stamped on the camera's images. This is the AatonCode method. In the video world they called it the ***'free-run'*** mode. Once initialized (four ways) Cantar behaves as an independent *master-clock*.

• *System/Calendar initialization*

At startup, Cantar uses the System/Calendar date and time to immediately initializes its internal high stability,1ppm TCXO, Sync clock, '***Stc***' (System-TC) is displayed in the rectangular screen. *To remind you to sync other equipment around* to the Cantar Sync clock, the '**int c**' icon keeps blinking until you press [shift] [TC jam].

• *Operator initialization*

In case you don't want to use the calendar date and time, the TCXO clock can be set by the operator, see AUDIO/TC.19 'OperTc Init'. '**Otc**' (Operator-TC) is displayed in the rectangular screen.

• *LTC initialization* (from Camera, VTR, GPS, etc.)

Cantar on TEST press [TC jam] for more than two seconds, this makes the entered SMPTE LTC jam the Cantar TCXO clock. '**Jtc**' (Jammed-TC) is displayed in the rectangular screen. [TC jam] has no effect if there is no valid timecode on the LTC inputs, '**Jam Failed No LTC**' appears in the rectangular screen and the '**int c**' icon continues to blink.

• *ASCII initialization* (from Aaton OriginC)

Cantar on TEST, its TCXO clock is set by an Aaton OriginC which also initializes cameras and GMT generators. '**Atc**' (ASCII-TC) appears in the rectangular screen.

Cantar becomes a master-clock

As soon as the **int c** icon stops blinking, Cantar starts generating timecode. This timecode is based on a TCXO (Temperature Compensated (X)crystal Oscillator), accurate to ±one frame in nine hours (1 ppm). This high accuracy makes Cantar THE timecode reference on set.

If you turn 'ON' the LTC generator output in AUDIO/TC.16 'LTC Gen Out', the LTC output can be used to continuously sync all equipment through cable or RF. You can also initialize several Aaton GMTs (low power, high accuracy, timekeepers), attach them to the cameras and digi-slates and have TC that matches the Cantar's TC.

Do not power down a master-clock!

Being on a job on which the free-run time-of-day TC is the essence (AatonCode camera, HD camera with GMT reference generator, smart digi-slate), never power down Cantar during the workday to avoid the loss of its 1 ppm reference time! While the internal HDD is in sleep mode the total power consumption is a mere 270mA! Set TECHSET.13 'HDD Pwr Dwn' to 'Aftr 5min', to have the HDD sleep five minutes after STOP. If you still want to power down Cantar at lunch time, the blinking **int c** icon at power up will remind you to re-initialize its own sync clock and all other timekeeping machines on the set.

Method 2
'int c' internal ***Record-Run*** driving clock

Go to AUDIO/TC.18 'RecRun Init', [ok]: 01:00:00 is proposed as the first TC of the day (it can be modified). From now on, at the beginning of each audio file Cantar will stamp a start-TC incremented by 2 seconds later than the preceding take's end-TC. This clocking, called Record-Run, produces audio files which appear as if they have been recorded in continuity.

If for some reason Cantar is turned off, the rec-run TC must be initialized again. To prevent any TC overlap, Cantar proposes to start on the next hour integer, e.g. if the last recorded take has been closed at 01:34:15, the next start-TC proposed to the operator will be 02:00:00.

The Cantar record-run mode lets you use the pre-record buffer without creating TC overlaps. For example, if the preceding take ends at 01:45:00, and the pre-record buffer is set at 35 seconds, the next audio file will start at 01:45:02 (two second gap), but the LTC emitted by the generator to the camera when hitting REC will be 01:45:37.

While Cantar is in 'Rec-Run' mode, its reference TC must be continuously sent to all cameras on the set by wire or RF.

Note: in TEST and PPR, the LTC output is frozen on the end-TC value, it can thus be used as a master TC to start and stop another Cantar ('Remote Roll', p.18).

Method 3
'int c' internal clock, ***AutoSlate*** on clapsticks

If the same TC is not running in Cantar and cameras, the only way to sync pictures and audio is to use clapsticks; forget digi-slates, they have too many drawbacks. The Cantar AutoSlate sample-accurate clapstick detection function puts a timecode crown over the simplest piece of wood.

Method 4
'ext c' ***slaved*** to an external clock

An externally-slaved Cantar stamps the audio files with the same TC as the one running in the video camera. This requires a link from the camera to Cantar.

Set AUDIO/TC.14 'TC Source' to 'Ext.Clock'; **ext c** blinks in the circular screen, meaning that Cantar is waiting to be slaved to an external LTC, e.g. a video camera. *Cantar, while set to 'external clock', will only jam when you go to REC; pressing the [TC jam] button will do nothing.*

Cantar is usually in REC before the camera, so it monitors the Lemo 5/SubD 15 incoming LTC and grabs it when coherent TC is received. That is why **ext c** keeps blinking until the camera is up to speed.

Before closing the audio file, Cantar stamps the TC by using the latest valid timecode so as to eliminate spurious transmission errors and false camera starts. If there is no external timecode signal, an 'LTC Not Detected' warning appears in the rectangular screen and a phone beep is triggered every four seconds. The beep is muted during 'w' (wild track) tagged takes (see 'Warning beeps', p.22). Nevertheless, the external TC is grabbed if it is received before the take's end. Note that external LTC breaks can be used to slave the REC start and stop (see 'Remote Roll', p.18).

Sampling Rate, Camera fps, Audio-TC

These parameters are theoretically not correlated. The number of audio samples per Earth second (Hertz), is called the sampling rate, e.g. 48000 is 48kHz.
48kHz and 96kHz are universal, The film/video 'frames per second' value should have no influence at all on the audio sample rate frequency.
The frame-rate used to express the audio time can be 30, while images are filmed at 24 or 25fps! Unfortunately, because of vintage post-machines, the NTSC drifting fps forces engineers to use tricks to sync real-time audio with drifting-time images, by using disgraceful 48048 or 47952 samples per second (Hertz).

On the planet Earth

Timecode handling is simple at integer speeds such as 24, 25 and 30fps. *It is more complex at 29.97DF where a drop-frame lookup table is used to keep the image frame count in line with Earth's time: the frame count jumps over two images every minute except for every tenth minute.*
Stored in the BWF metadata, the camera fps is a simple reminder and can be changed later and then applied to the audio LTC used in some audio-post sync operations.

[U] Universal : 24.00 ... 25.00 ... 30.00 ... 29.97DF
In a file digitized at 48kHz, the Format stamp indicates the number of samples digitized in a real-second, i.e. 48000; the Time-stamp carries the number of samples since midnight using the sample rate value found in the Format stamp. *Exactly the same logic is used in the Barebone mode-B of the 'slow-planet' recording mode.*

On the 'slow-planet'

Unfortunately, NTSC-compatible 23.976fps HD cameras cannot use anti-drift lookup tables because nobody ever found a clever way to emulate the counting compensation invented for 29.97fps.
When shooting HD in the U.S., the 'slow-second' still imposes its rule. *The slow-second is the time it takes to shoot 30 frames of NTSC video, i.e. 1.001 Earth second).*
As soon as you enter ***Camera fps = 23.98NDF*** or ***29.97NDF***, Cantar knows it must work in the 'slow-second' world, its TCXO clock switches to a slower beat and the TC separators change from '**:**' to '*****', e.g.12*45*36; you are on the slow-planet with its 24 lazzy speed (aka 23.98NDF on Earth) and 30 lazzy TC (aka 29.97NDF on Earth).
Many nights of engineers' time have been spent trying to find a universal method to sync sound and images on the slow-second planet but nothing came out. In the U.S. you must ask your post-facility which one of these *three sample-stamp modes* is requested:

(A) *Avid v11: '23.98NDF–A', '29.97NDF–A'*
In a file digitized at 48kHz, the Format stamp indicates the number of samples digitized in a slow-second, i.e. 48048; the Time-stamp is the number of samples since midnight, using the 48048 value of the Format stamp.
Introduced on the AvidMC v11.3.2, the 'A' mode is being replaced by the 'C' mode. See 'Avid-Recording-Rates' www.aaton.com/files/avid-recording-rates.pdf.

(B) *Barebone: '23.98NDF–B', '29.97NDF–B'*
In an audio file digitized/recorded at 48kHz, the '*B*' stamp indicates the number of samples digitized in a real-second, i.e. 48000; the Time-stamp is the number of samples since midnight using the 48000 value of the Format stamp.
While images and timecode are beating the slow-second, the audio remains on Earth! Since recent post-machines (e.g. Indaw) perform high quality real-time sample rate conversion, 'Barebone' and 48kHz should be THE choice.

(C) *Compensated: '23.98NDF–C', '29.97NDF–C'*
Mode for challenged post-machines: in a file digitized at 48kHz, the Format stamp indicates the number of samples digitized per real-second, i.e. 48000, but the Time-stamp is the number of samples since midnight as digitized in slow-seconds, i.e. 48048 (no longer the Format stamp value!), hence the 'F' suffix (for Fake or Faux) used by some manufacturers.
If it is 02h00m00s on Earth at REC start, the Time-stamp shows 345,945,600 samples (02h x 3600s x 48048).

Audio inputs

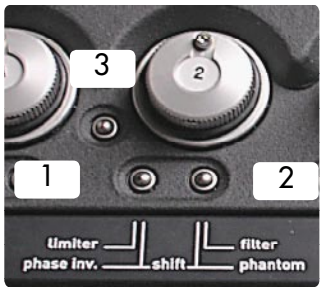
This position opens access to audio signal testing.
Five microphones: M 1, M 2 & M 5 on XLR 3 and M 3 & M 4 on XLR 5.
Four line-in: L 1 & L 2 on XLR 5 and L 3 & L 4 on XLR 5.
Eight AES-in: Tascam SubD 25 (pin-outs p.50).

Microphone Preamps

The Cantar mic-preamps offer such a wide dynamic range in one stroke that they don't need any pre-conditioners or trims.

Dynamic or Phantom

Press [shift] [so-fil-tom] (2) to toggle that mic's phantom power 'ON/OFF'. The default setting for Phantom 48V is 'ON' for all mic-inputs. When connecting a dynamic microphone, turn 'OFF' the phantom power; the mic-preamp gain will be boosted by 12dBu. When the phantom power is disabled, the triangle below the mic number disappears from the right circular screen.



Limiters

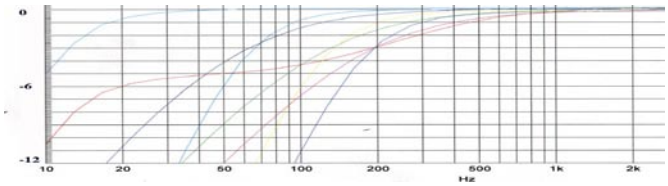
Press [lim-inv] (1) to toggle the limiter 'ON/OFF'. While the limiter is turned 'ON', a triangle is displayed below the mic number on the left circular screen. If the signal level reaches the limiter zone (-8dBFS), the triangle will start blinking.
In 24-bit recording mode, it is common practice to adjust the input gain so that a 'normal' signal does not go over the -20dBFS level. When the limiter is activated, the 32dBu head-room above the -8dBFS kick-in point gives 24dBu above the 'no-limiter' full scale. The operator can count on a 44dBu reserve over the normal -20dBFS level. If the signal does reach the -1dBFS level, a 'clip' icon appears at the end of the modulometer scale and a beep can be sent to the headphones (TECHSET.05 'Clip Detect').
To maintain equilibrium between linked channels, the same limiter command is applied to ganged preamps.

Inversion

Press [shift] [lim-inv] (1) to invert the phase of a mic-input signal; a triangle appears below the concerned mic number on the middle circular screen.

High-pass filters and attenuators

The default setting is 'Mic Level - Linear' on all mic-inputs. Press [so-fil-tom] (2) and [jog] to select a corner frequency/slope of which you control the effect in solo mode.
The first bank of filters, 'Mic Level', appears in the rectangular screen, it goes from 60Hz/-6dB to 180Hz/-12dB and LFA.



The second bank, identified by 'High Level', activates an 8dBu translation on the mic fader command which puts it in about the same angular position as when a lower sensitivity mic is used.
The third bank, identified by 'Line Level', activates a physical 24dBu attenuator which converts the mic-inputs to line-inputs. This third bank is available on Cantars equipped with internal attenuators (ref. SL1).

Differential delays (Cantar-X2)

Delays inherent to sound propagation (3 ms/m) or introduced by signal processing (up to 3.8 ms in a digital wireless kit) can induce 'phasing' interference between mics placed at different distances (or time) from a sound source. In some instances it is advisable that all other audio inputs contributing to the onboard mixdown wait in a buffer for the 'late-sound' arrival.
In TEST, press [shift] [silver], 'Toggling to delays' is displayed, press [>] and [<] to scroll over Mic 1 to Line-in 4; press [ok] on the one to be set, [jog] from 0.0 to 85.0 ms delay in 0.1 ms increments (1 ms increments by [shift] [jog]). You can fine tune the delay by listening to the tracks in 'double-solo' (see 'Solos of the tracks', p.21).
To protect your ears, a short mute is triggered each time you modify a delay. Note that the value of the longest delay is applied to all other channels except for the one being set. Example: you want a digital wireless lavalier (3.8 ms processing delay) feeding Line-in 1 to be in-phase with a boom at 6m distance (18 ms sound propagation time) feeding Mic 5. Set Mic 5 at 18 ms and Line-in 1 at 3.8 ms. All analog inputs will be buffered by 18 ms but Line-in 1 by (18 – 3.8) 14.2 ms, and Mic 5 by 0.0 ms.

On the timecode side, since the group delay can go up to 85ms (two film frames), the TC stamp in each audio file is corrected accordingly. Each analog input delay is noted in the BWF's iXML chunk and in the CSV Sound-Report file.

Mic Coupling

Go to AUDIO/TC.10 'Mic Links' and select one of the available couplings: '1+2 3+4' (default mode), or '1+2+3', etc. Phantom, Limiter and Highpass-filters are identically applied to the coupled faders. Phase inverters remain independent. All of these couplings remain active when the Cantar on-board faders are taken over by the CantaRem linear sliders.

Stereo-pairs

Set AUDIO/TC.10 'Mic Links' to '1+2 3+4'. Press [shift] [link-lock] (3) between the Mic 1 and Mic 2 faders; a dot appears between '1' and '2' in the bottom of each modulometer; Mic 1 becomes the master of Mic 2. Press [shift] [link-lock] (3) between the Mic 3 and Mic 4 faders; a dot appears between '3' and '4' in the bottom of each modulometer; Mic 3 becomes the master of Mic 4.

Surround sound

Set AUDIO/TC.10 'Mic Links' to '1+2+3+4+5'.
Press [link-lock] (3) between the Mic 1 and Mic 2 faders, Mic 1 becomes the master of the gang.

Masters and slaves

Whenever you rotate a fader, all fader values are displayed on the rectangular screen; the master(s) is 'highlighted' by a black square, the slave(s) by a pipe. The slave tuning range is ±12dBu of its master's value.

Protecting the balances

Provided the balance has been locked in AUDIO/TC.09, the tuning of slaved prefaders is protected against flying fingers (a key appears in the rectangular screen). Balance modification can only be done while pressing the [so-fil-tom] button (2). The memorized gain value is displayed in dBFS on the rectangular screen, the physical position of the fader is shown by < > signs. There is no sudden level change if re-activation takes place when the fader is positioned in such a way that the 'pipe' sign is displayed.

M/S pair handling

While routing inputs to tracks (see 'M/S Declaration', p.27), and passing over the '**m·s**' icon, activate it to make the monitor decode the M/S signals into M+S and M-S, i.e. L/R *stereo*. For M/S *mono* monitoring, see 'Pan-pots', p.21.

Locking the Faders

Press the [link-lock] (3) button (between Mic 1 & Mic 2 faders) to (dis)able the mixer's linear faders; press the [link-lock] (3) button (between Mic 3 & Mic 4 faders) to (dis)able all rotary faders. Any action on a disabled fader causes the rectangular screen to display 'Locked Fader' instead of its gain value. To prevent inadvertent (un)locking, the button must be pressed for a full second for the action to occur.

Headphones

To facilitate extraction of a right angle 1/4" jack plug, a must to direct the cable out of your way, the headphone socket is slanted toward the bottom of the machine. This makes a long straight plug hit the table on which you put Cantar. The headphone amplifier can drive 8-ohm loudspeakers: quite a helpful feature to send playback audio tracks to the stage.

Rec&Play rehearsal *see p.44* [BLUE-TEST]

The playback tracks (Tp1 – Tp6) are internally connected to the Digi1-6 inputs and from there routed to the recording tracks*. BLUE-TEST is used to verify the *In-grids* and *Out-maps*, to adjust the relative levels between the playback tracks and the analog inputs, and to rehearse the BLUE-REC play-card to play-card navigation.

You can also use it to quickly go from one play-card to the next without the hassle of scrubbing through the entire play-file, a nice feature to give a film-director an 'aperçu' of a questionable take.

Rec&Play only works at 48kHz (±0.1%); the playback files are played at the 'Live' recording sample rate. If there is a discrepancy, e.g. 'PBck-48048Hz' vs 'Rec-48000Hz', a reminder is displayed in the rectangular screen but you can nevertheless proceed to record.

* *Sept. 2008:* connected to the SubD25 AES-In/Out, a Level&Delay accessory can loop the playback tracks through digital faders back to the Digi-ins. In addition to its AES level adjusting ability, it mixes and sends an analog stereo playback to the stage. There is no longer a need to set the Cantar *Out-maps* for this purpose.

The **Pre-Post-Record** position is unique to Cantar, it offers three essential functions: pre-record buffer activation, metadata entering/editing and last take erasure.

Pre-record buffer

While the [MainSelector] is on PPR, the pre-record buffer stores the audio in a First-in/First-out (FIFO) buffer memory and dumps them to the HDD as soon as REC is activated. The '**•rec**' icon blinks under the disk(s) selected for recording.
Once the buffer is full, and it starts discarding the first-in audio, the middle platter of the 'three-platter' icon disappears. This is a quick way to verify the pre-record buffer length. This length can be modified (up to 35sec. @ 48kHz), in AUDIO/TC.08.

PRE-Record Metadata entry

While in PPR, press [shift] [silver] to enter scene, take, comments, track-names and TapeRef before or after the recording of a given take. (The use of R.can or keyboard speeds up the process).
Note: [shift] [jog] accelerates letter scrolling 10x.

1 Scene and Take

The first screen displays '**Seq Scn Tak**'. Press [ok] to go down to the bottom line and use [>] or [<] to scroll along the characters and modify them with [jog.] Press [ok] to store and exit.

• The default template is **nnnA/nnA.nn** for 'sequence, scene, take-type and take #'. To accelerate [jog] action, this template minimizes the set of letters to those most frequently used:
- *Sequence:* three digits, followed by one character from this list: 'space', A, B, C, D, E, F, R, S, T, a, b, c, d, e, f, r, s, t, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
- *Scene:* two digits, followed by one character from the list above.
- *Take-type:* t = time sync audio, p = pick-up, w = wild track, a = announce, n = no-good. This ***tpwan*** is selected with the [red] button.
- *Take #:* two digits.

• An open **CCCCCCCC.CC** template is also available, (see AUDIO/TC.11 'ScTk Templt', p.30). At each new take, the sequence & scene is maintained and the take # is incremented by one. Modifying the sequence or scene causes the take # to reset to 1. The rectangular screen displays the filetag of the NEXT recording.

2 Comments

[jog] to '**Tk Comment**' and press [ok] to activate the bottom line where the former comment appears. Characters (max: 200) can be entered with [<], [>] and [jog] but it is much easier to use a keyboard or a remote PDA with R.can.
Depending upon the keyboard [insert] key toggle status, a flickering square (insert) or a flickering pipe (overwrite) is displayed. Enter your comments. and press [ok] to validate.
Note: *To erase the comment line inherited from the preceding take, press [shift] [esc].*

3 Track-names

[jog] to '**Track Name 1**', [ok] to go to the bottom row. [shift] [jog] or keyboard's [shift] [up/down] arrows show the available list of track-names.
Track-name completion relies upon a library of the last thirty track-names in use. This automatic process speeds up track-naming by letting you pre-store the names of the film's main actors and swiftly recall them by their first two letters. Press [ok] or [enter], and [jog] to '**Track Name 2**', etc.

Library cleaning
By [jog]-ing past '**Track Name 8**' you reach '**Del TrkName**', [ok], select the track-name to be deleted, [ok]. If you decide not to delete it, press [esc]. In a bind and no time to name the tracks of the next take, it is better to remove the former take's track-names than to write incorrect ones.

Go to the track-name editing line (any track will do), and press [shift] [esc]; the following generic names will replace them : T1 to T8 on native monophonics; ms-M and ms-S on M/S tracks ; MixRight and MixLeft on mixdown tracks.
Press a [track-solo] button to display that track's name in the rectangular screen.
Note1 : To allow for a possible entry from a PDA, the generic track-names above are only recorded upon completion of the take.
Note2 : The default entry mode is 'overwrite', if you change it by selecting 'insert' on a keyboard, it will revert to 'overwrite' on the tenth character since track-names are limited to this number.

4 Prod TapeRef
The TapeRef (*Production Tape Reference)* overwrites the automatic Cantar generated MMDD *DayStamp* and replaces it with either the incremented "Shoot Day Number" of the project, or something like the VideoTape ID, called the "Roll Number" (see 'Practice 2', p.43).

POST-Record Metadata entry
After REC, go back to PPR: the scene, take and filetag to be used for the next file recording is displayed. If you need to modify the previous take's information, press [shift] [silver], the rectangular screen displays EDIT, the PREVious filetag, and the scene and take of the last recorded file. Press [ok] then [>], [<] or [jog] as explained in the preceding paragraphs.
You can modify the take-type (*tpwan)* with the [red] button. Press [ok] to confirm, then [shift] [silver] to close and go back to displaying the NEXT take's characteristics.
Scene and take can also be modified later by selecting the file in BROWSE, and performing the same editing operations as described here in PPR.

Pazienza! paciencia! patience!
When editing metadata entries, you are modifying the native files stored in the internal HDD. If you are working in simultaneous (mirroring) mode, these modifications are immediately applied to the external drive files as well. But if you are working in IdleCopy mode, they will only be applied later when Cantar is in TEST or STOP position.

So, at the end of the session, remember to not unplug the external HDD nor to remove the DVD-RAM disk in haste; wait until IdleCopy finishes its revamping work!

File splitting
Manual split
To divide a file into shorter segments quickly go from REC to PPR and back to REC. A new file is created; it carries the same scene ID and the take # is incremented. You will not lose a single audio sample. A short pre-silence is added at the head of the new file to ease the splicing work in post. By setting the PPR buffer to a long enough duration you can even enter new scene and take IDs and comments.

Automatic split
If you need to record audio during very long periods without interruption but you don't want files larger than 4GB, Cantar automatically closes the file and starts a new one: four settings are available: 260MB (e.g.1 track for 30 min @24-bit/48kHz), 690MB (700MB CD-R capacity), 2GB (default setting), 4GB (FAT32 max. filesize). The filetag is incremented but the scene and take IDs remain the same.

Last take erasure
Purposely, Cantar lets you delete the last take only, e.g. a false start. In PPR, open 'Edit' by [shift] [silver], select 'Delete Take'; toggle from 'No' to 'Yes'; [ok]. As further protection, the latest position must have been REC, and the power must not have been turned 'OFF'. If you want to erase a complete disk, go to SESSION.04 'Disk Format'.

Note1: 'Take' represents a 'file group' sharing the same scene, take and filetag, e.g. CD2234 represents the monophonic files CD2234_1 to CD2234_8.

Note2: when poly files have been requested, they are created in Cantar's idle state (PPR and TEST), after the recording has stopped.

Remote Control

Remote by LTC

This function is also called 'Remote Roll', 'Auto-load' or 'Remote record' depending on the country and manufacturer.

Select AUDIO/TC.13 'Rec by LTC' (p.31): Cantar starts recording upon receiving **running LTC-in** and stops recording upon receiving **frozen LTC-in** generated by a video camera or an Aaton GMT (see'GMT-u p.48).

Note that the TC which is stamped in the files is Cantar's own TC if set in master '**int c**' or the one carried by the 'remoting' LTC if set in '**ext c**'.

The 'remoting' LTC can carry a continuous *record-run* TC or a discontinuous *free-run* time-of-day TC. No time overlaps are created on the breaks since Cantar waits for 3 seconds to validate the new LTC then goes to REC while splicing the preceding three second audio stored in the pre-record buffer.

If you want to continue the recording knowing the camera is about to stop, swiftly switch from PPR to REC.

Remote by keyboard

In PPR, Cantar can be controlled by a PS2 **keyboard** through a *USB-PS2 to SubD 15* converter (p.50).

Press [ctrl] [alt] [*], where [*] is a letter:

[r] = REC	[g] = IN-GRIDS
[p] = PPR,	[m] = OUT-MAPS
[t] = TEST,	[a] = AUDIO/TC
[s] = STOP	[k] = TECHSET
[l] = PLAY	[c] = BACKUP (Copy)
[b] = BROWSE	[J] = SESSION

Use the vertical arrows or the numeric pad to scroll the parameters, use the horizontal arrows to select the parameter value, press [enter] for 'ok', [escape] for 'esc'.

Remote by Cantarem or PDA

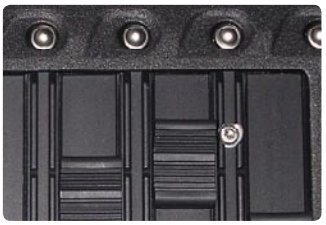
See **CantaRem** (p.46) and **R.can-w** (p.47).

Recording

In REC, a '● **rec**' icon is displayed under the active disk drive and a red LED lights up underneath this icon. While in REC, both batteries are paralleled for additional safety.

Modulometers

In REC, PPR and TEST, the modulometers display the level of the signals to the tracks. The circular modulometers' resolution is 1dB in the -35dBFS to -12dBFS working zone The rectangular screen modulometers' resolution is 2dB in the same zone. The ballistics emulate needle modulometers. The decay time can be adjusted in TECHSET.09 'Meter Speed' from '**1 Fast**' to '**5 Slow**'. In low temperature environment, '**5 Slow**' is recommended. The default is '**3 Med**'. The peak-meters are always active, and their 'hold' period can be adjusted from 0.5 to 5 seconds (TECHSET.10).



Soloing tracks

Pull the [**Solo**MixPan] slider to Solo (operator side). Press a [track-solo] button, you will hear the track's audio in both ears. While maintaining pressure on a solo button, press another one. You will hear the first soloed track in the left ear, and the second in the right ear. Use this feature to compare track levels, phases or differential delays.

When a [track-solo] is activated, the selected track's modulometer is differentiated from the others by a 'dashed' appearance.

Soloing inputs

It is easy to monitor a questionable mic input by rotating the [monitor] crown to **So** or pressing its [**so**-fil-tom] (2) button.

Built-in Mixer

Pan-pots Push the [SoloMix**Pan**] slider to PAN (battery side). Each track can be sent to the left or right tracks of the mixdown. Press the [track-solo] button and [jog] the marker to the left or the right of the circular screen. When it is in the center it provides a mono mix. The value in dBFS of what is left to the other side is displayed on the rectangular screen. When a track pair is declared 'M/S', the pan goes to the

middle and it is L/R decoded into the mix. If you create a Phone-out or Line-out monitor configuration out of an M/S declared pair, you will get pure stereo.

If you pan the M track to one side or the other, it goes 100% to the right or left, and the S signal disappears from the mix. That is the way to mono monitor an M/S pair.

Mixer Sliders Once the pan-pots have been set, each track's contribution to the mix is adjusted with the mixer's sliders. The maximum gain can be either +6dBu or 0dBu (AUDIO/TC.07 'MixGain Max'). To listen to the mixdown, set the [monitor] crown to **Ph** and [jog] to 'Ph MX'.

Mixer Bargraphs The mixer Xa · Xb outputs, when recorded on tracks T7 T8, appear on the rectangular screen top row. dBFS values: -50 -45 -40 -38 -36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -9 -6 -3 .0 .Clip.

[jog] overwrites the bargraphs with the battery voltage, the available disk space, and the remaining recording time, calculated from the current track count, bit-depth and sample rate.

Note: pressing the [eye] button toggles display of T5 T6 or T7 T8 on the right modulometer.

Reference Tone generator

In TEST, PPR or REC, [shift] [red] sends a 1kHz tone to the tracks, modulometers and Xa · Xb mixdown. '**-18dBFS**' or '**-20dBFS**' can be selected in AUDIO/TC.03 'Tone Level'. Releasing [shift] before [red] locks the tone 'ON'; activating [shift], turns it 'OFF'.

Talkback mic

In TEST, PPR or REC, press and hold the [black] button to send the talkback to the left channel (see AUDIO/TC.04 'TalkbackMic'); quickly press [black] then press and hold it to send the talkback to the right channel. Press [shift] [black] to send the talkback to all tracks.

Warning beeps

The beep level is set in TECHSET.08 'Beep Level'. **One beep**: record start (04), clip detection (05). **Two beeps**: record stop or low priority problem such as low battery voltage; the 'Lack of external clock' (06) is automatically disabled on 'w' (wild track) takes. **Three beeps**: high priority problem, e.g. unplugged external HDD.

Headphone level

The headphone level is protected by [shift] and is displayed on the rectangular screen. Rotating the fader makes '**<**' and '**>**' appear. There is no level change if [shift] re-activation is done when the fader is put back in its 'pipe' (I) position.

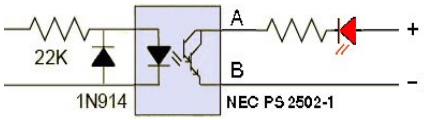
Take-type

While in PPR or REC, press the [red] button to toggle the take-type: t=time sync audio, p=pick-up, w=wild track, a=announce, n=no good. Remember: '*t p w a n*'.

Record tally

In REC, the SubD 15 pin-11 is grounded by an open collector transistor (max: 40mA). *Do NOT use a coil activated device on pin 11, the flyback voltage would kill the transistor.* Use an opto-coupler (see drawing) to avoid ground loops.

9 Batt (+12V)
11 Rec Tally
SubD 15



AutoSlate

In AUDIO/TC.12, select the slate detection channel.

While in REC, press [shift] [silver] *within six seconds* after a clapstick; the most plosive event preceding [shift] [silver] creates a Slate Mark. The successive slates generated by a multicamera shoot are labeled SA, SB... SG. The clapstick quality is displayed in the rectangular screen, 25% should be a minimum; at 75% score, you can congratulate the slateman! If you forget to press [shift] [silver], AutoSlate detects the most plosive sound of the take with a 95% chance of selecting the clapstick; in this case the Sound-Report's Slate-TC appears in '*Italic*' to show it must be either confirmed or ignored.

While in PLAY, [shift] [silver] starts the playback at the slate-marks. Majax displays an upright slate icon on start-slates and a bottom-up icon on tail-slates; click the icon to listen to the slate announce.

Markers

Press the [silver] button to create User-Marks labeled UM1, UM2... UM10 on wind clicks, boom noise, dialogue slip, etc.. *While in PLAY* they are accessible with the [silver] button.

Perform Rec&Play *first read p.44* [BLUE-REC]

Routing: before going to BLUE-REC, verify in BLUE-TEST (p.17) the *In-grid* is the one tailored for the job.

Navigation: Go to 'accessible' play-files with [shift] [>], and to 'accessible' play-cards with [>]. Upon reaching the last play-card of a play-file, press [>] to jump to the first play-card of the next play-file. It is *much easier* to use a keyboard to reach the desired play-card; just type the ID (B12, F45, A08, etc.), then [enter]. Tarkan (p.45) can easily enter the play-list in the required sequence.

Live playback: To start the playback, press [ok] or [space bar]; to stop before reaching the cue out-point, press [ok] or [sp]; to replay from the in-point of the play-card, press [ok] or [sp]. To pause, press [esc]; to resume, press [esc].

Clone remix: No need to press [ok], the 00 play-card plays at BLUE-REC start. To select a different play-card, go back to BLUE-TEST. To abort a remix, go to PPR, delete the bad take and return to BLUE-REC to start another take. Continuing to record live sounds at master play-file end is allowed but make it short since this generates a longer file than the master at the risk of timecode overlap with the next take.

Clone Re-rec: First set seven *In-grids* (*b1 to *c2 below). In BLUE-BRWS.21, select '**Clone A**'. Using *In-grid* *b1, record the first track in normal REC. In BLUE-BRWS.04 put the filetag of your best 'first track' recording (not always the latest one) under '**Index A**'. Using *In-grid* *b2, record the second track in BLUE-REC (as many times as necessary). In BLUE-BRWS.04, put your best 'second track' recording under '**Index A**'... etc.

*IN-GRIDS: *b1=[Mic1->T1] *b2=[Mic1->T2, Digi1->T1] *b3=[Mic1->T3, Digi1->T1, Digi2->T2] *b4=[Mic1->T4, Digi1->T1, Digi2->T2, Digi3->T3] *b5=[Mic1->T5, Digi1->T1, Digi2->T2, Digi3->T3, Digi4->T4] *c1=[Mic1->T6, Digi1->T1, Digi2->T2, Digi3->T3, Digi4->T4, Digi5->T5] **c2=[Digi1->T1, Digi2->T2, Digi3->T3, Digi4->T4, Digi5->T5, Digi6->T6] (* Set AUDIO/TC.20 'T7T8 InGrid' on 'None'. **set AUDIO/TC.20 on 'Mic1->T7, Xb->T8').*

PLAY (BLUE-PLAY)

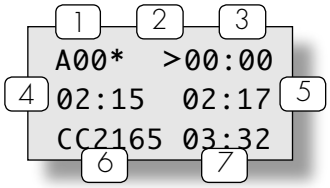
Commands

[ok]	starts/stops&sends to cue-in
[shift] [ok]	*displays digitization parameters and TC fps*
[<] [>]	go to prev/next play-card (or file if no card)
[shift] [<] [>]	*go to the prev/next play-file*
[esc]	play pause/resume
[shift] [esc]	*toggles continuous file to file play (PLAY only)*
[black]	cue-in, volatile in PLAY
[shift] [black]	*sends player to start of take*
[red]	cue-out in BLUE-PLAY; erases cues [jog]ed to 00:00
[shift] [red]	*hides play-card from Rec&Play list*
[silver]	sends player to record-entered markers
[shift] [silver]	*sends player to AutoSlate marks*
[jog]	scrubs audio
[shift] [jog]	*accelerates scrub 10 x*
[eye]	toggles tracks 5/6 vs. 7/8 on right screen
[shift] [eye]	*toggles filetag&duration vs. scene&take (stored pref. until Cantar is turned 'OFF'). N.A. in BLUE-PLAY.*
[TC jam]	toggles player's relative time with absolute TC

Rectangular screen

1 A01 play-card label; ***** hidden from Rec&Play list.

2 **>** normal speed; **▮▮>** pause; **–>** non-stop play; '**m1**' user record marker; '**sA**' autoslate marker; **■** stop (end of file).



3 cue-in (volatile in PLAY).
4 scrub position [jog].
5 player pos. or absolute TC.
6 filetag (or scene [shift][eye]).
7 cue-out (or take [shift][eye]).

Notes:

• the displayed mm:ss time is relative to the start of file, the file absolute TC appears by pressing [TC jam].

• in PLAY and X00, the cue-in (3) is volatile, i.e. not stored when exiting; the out-point (7) is the end of file, i.e. the duration.

• in scrub, each [jog] tick moves the player by one second, delivering very intelligible forward and reverse dialogue.

• to edit 'scene & take' entries, scrub over the autoslate mark, listen to the announce, then go to BROWSE.

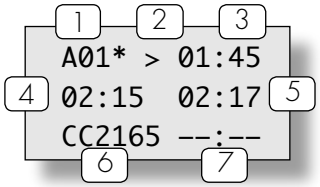
• to read the size of *one* track of a group, go to BROWSE.

• the LTC output carries the TC & fps of the play-file, not the project TC, it can be used to slave a chasing VTR.

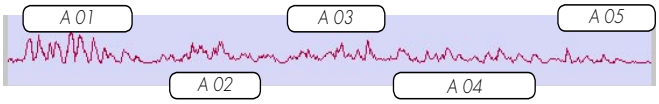
Create play-cards *see p.44* [BLUE-PLAY]

1- Select a play-file: with [shift] [>], choose a file among the BLUE-BRWS indexed ones, the file index 'A to L' is displayed in (1).

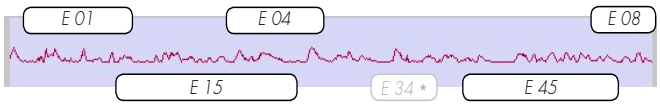
2- Select an empty card : with [>] or [<], open an empty card, e.g. A01, among the fifty-one per play-file. The default A00 play-card only lets you play the entire play-file without storing cue-points (its 'cue-out' (7) is the take end, i.e. duration).



3- Insert/Erase cue points: to fill an empty card, scrub the audio with the [jog] (4), press the [black] button to set the in-point (3), scrub further and press the [red] button to set an out-point (7); a half second silence is inserted at the out-point to let you detect and fine tune its position. The last entered cue-points replace the former ones. Once a cue-in point has been entered (a cue-out point is not necessary), an empty card becomes a 'play-card'. It is stored in the iXML chunk of the play-file and will only be removed if you erase the play-card; to do so, [jog] to 00:00 and press [red].



Play-file 'A' from the current project containing five play-cards.
Note their logical placement suited to an 'ADR' playlist.



Play-file 'E' from the archives, six play-cards (E34 hidden).
Note their free and overlaping placement suited to 'Play@call'.

To hide a play-card without erasing its cues, press [shift] [red]; tagged with a '*****' character it will no longer be visible in the BLUE-TEST/BLUE-REC play list, shortening it (empty cards do not appear in the play list either).

Activate play-cards [BLUE-PLAY]

With [>], select a play-card and press [ok] to play it from its cue-in; there is *no delay* between pressing [ok] and the sound output. If there is no cue-out in the play-card or if you want to stop the playback before reaching it, press [ok]. Press [ok] again to restart from the cue-in. Press [esc] to pause, press [esc] to resume play.

Reminder: when going to BLUE-PLAY, take your time while passing over STOP; if the message '**you were too fast**' appears, go back to STOP for one second.

BROWSE (BLUE-BROWSE)

Edit metadata [BROWSE]

Find a file By default BROWSE opens access to the *Internal HDD* and *Current Project*. To get access to files located on an external drive and in another 'Project', you must first go to SESSION.03 and select '**Ext.HDD**', then select the project in SESSION.01 'ProjectName', and return to BROWSE. Select a *Day* by [jog] & [ok], the last take's *filetag* is displayed, search other filetags by [jog], press [ok] on the one to be edited and/or played. The displayed 'MB' is the size of *only one* of the tracks of the group.

Edit the file Edit the scene, take, comments and track-names as you do in PPR, see 'Metadata' p.18. The [red] button toggles the 't p w a n' take-type (editing can also be performed from the 'browse' position of R·can-w, see p.47).

Wake-up HDD When Cantar is left on STOP, the HDD goes to sleep after the time interval set in TECHSET.13; when going to REC, waking it is not a problem because the pre-record buffer hides the disk spin-up, but going directly to BLUE-BROWSE makes the rectangular screen display: '**asleep, no disk**', then '**back & forth**' (this can make the play-files inaccessible (No)). To wake up the disk, go to TEST and wait for the 'three-platter' icon to show up, then go to BLUE-BRWS.

Play-file indexing *see p.44* [BLUE-BRWS]

For Rec&Play to work, you muts first prepare the files which will be later used for 'playback'. You must select them from the thousands stored on your disks by putting them under an ***index*** which makes them available as 'play-files'.

Indexes **A** and **B** are reserved for the ***current project*** play-files coming from the current workday, and indexes **C** thru **F** for other workdays. Indexes **G** thru **L** are reserved for ***archive*** play-files, e.g. wild tracks, music, etc., stored on an external HDD or the internal HDD. They must be stored on the same drive, same project, same day (and carry an iXML v1.50a chunk in compliance with Cantar software v2.11 or later). To update old style files, copy them in 'Clone' mode into a 'NeuArchv' project folder. To convert an MP3 audio programme, record it 'Live' through an analog input, using '**Otc**' to give it a timecode.

Play-file presetting [BLUE-BRWS]

Accessibility

To speed up metadata loading, the play-files not needed in the next Rec&Play operation should have their *accessibility* changed from '**Yes**' to '**No**'. This is done by exiting the file selection bottom row with [esc] instead of [ok].

Temporality *in BLUE-BRWS.21*

• **'Live'** causes the recording session to use the current TC and metadata, and gives access to *all* accessible play-files.

• **'Clone'** causes the recording session to use the TC and metadata of *one* given play-file, e.g., selecting 'Clone E' toggles the play-file 'E' accessibility to '**Yes**' whatever its previous state, and will force BLUE-REC to work with this file.

Current project play-files		*Archive play-files*
BLUE-BRWS 01 Drive Internal	set in SESSION (not modifiable)	BLUE-BRWS 12 Arch Drive < External
BLUE-BRWS 02 Project Shadows	set in SESSION (not modifiable)	BLUE-BRWS 13 Arch Pject < NeuArchv
BLUE-BRWS 03 AB today 2007-11-24	the current workday (not modifiable)	BLUE-BRWS 14 Arch day < 2005-01-01
BLUE-BRWS 04 Index A < SE1234 Yes	select a file from the AB day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 15 Index G < SE1234 Yes
BLUE-BRWS 05 Index B < SE1205 Yes	select a file from the AB day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 16 Index H SE1205 No
BLUE-BRWS 06 CD day < 2007-11-23	select a day in this project [jog] then [ok]	BLUE-BRWS 17 Index I < SE1205 No
BLUE-BRWS 07 Index C < ------ No	select a file from the CD day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 18 Index J < SE1104 Yes
BLUE-BRWS 08 Index D < SE1104 Yes	select a file from the CD day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 19 Index K < ------ No
BLUE-BRWS 09 EF Day < 2007-11-18	select a day in this project [jog] then [ok] ([esc] to hide)	BLUE-BRWS 20 Index L < SE0980 Yes
BLUE-BRWS 10 Index E < SE0987 Yes	select a file from the EF day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 21 Temporal < Clone X
BLUE-BRWS 11 Index F < SE0980 No	select a file from the EF day [jog] then [ok] ([esc] to hide)	BLUE-BRWS 21 Temporal < Live

Operand positions.

MainSelector East positions

The MainSelector, easy to manipulate even with heavy winter gloves, gives direct access to all essential functions.

The OPERAND positions establish Cantar's operating parameters with no deep diving into sub-menus.

IN-GRIDS	'inputs to tracks' grids.	(5h)
OUT-MAPS	'outputs monitoring' maps.	(6h)
AUDIO/TC	settings showing in the audio files and TC signals.	(4h)
TECHSET	settings for day-in day-out use.	(3h)
SESSION	projects, disks and Sound-Report.	(2h)
BACKUP	archiving audio files.	(1h)

MainSelector buttons

IN-GRIDS and OUT-MAPS positions

• [black] creates a link • [red] removes a link.

Rectangular screen rows

Operands are displayed in a way which always indicates their path-tree. Parameters' labels and values are browsed by [jog] and/or [>] [<] arrows.

```
AUDIO/TC  01
SampleRate
48048
```

• Top row : **Operand, Parameter #**
• Middle row : **Parameter Label**
• Bottom row : **Parameter Value**

IN-GRIDS p.26

OUT-MAPS p.28

AUDIO/TC p.30
20 T7 T8 In-grids*
21 Digi 1-6 Out-maps
22 Digi in/out power
01 Sample rate
02 Bit-depth
03 Reference tone level
04 Talkback mic routing
05/06 Line-out / Foldback level
07 Mix gain max
08 Pre-record duration
09 Balance fader lock
10 Mic fader links
11 Scene & Take templates
12 AutoSlate trigger channel
13 Record by LTC
14 TC Source
15 LTC rate
16 LTC generator output
17 LTC User-bits
18 Record-Run TC initialzation
19 Operator TC initialzation
23 CantaRem communication
24 to 31 CantaRem slider assign

TECHSET p.32
01 Disk (un)mount
02 Backlight
03 View Faders' dB
04 Record beeps
05 Clip detection beep
06 Lack of external clock beep
07/08 Beep routing/level
09 Meter speed
10 Peak hold duration
11/12 Batt1/ Batt2 alert levels
13 HDD Power Down
14 Serial Communication port
15 Factory Reset
16/17 Save/Load User's Setup
18 Max File Size
19 Temperature Control
20/21 System Time/Date
22 Equipement IDs
23 License key
24/25 Software version/Load

SESSION p.35
01/02 Select/Create Project
03 HDD in Use
04 HDD & DVD format
05 Scan disk
06 Delete-file access
07 to 13 Sound-Report headers
14 Column layout selection
15 to 29 A-Columns 02 to 16

BACKUP p.38
01 Save mode
02 Day to copy
03 Track selection
04/05 T1–Tx T7T8 treatment
06 Media type
07 Burn and check
08 Files to copy
09/10 File name/Media label
11/12 Snap/Idle Sound-Report
13 Clean Poly files
14 Run Backup

*Italic indexes to be reshuffled next release.

Routing inputs to tracks

Cantar records eight independent monophonic tracks; physically identical, they are separated into two groups: T7 T8 and T1 to T6.

T7 T8

Originally devoted to the recording of the mixdown, these two tracks are handled in a specific way. The T7 T8 signal levels are displayed on the right circular screen by pressing the [eye] button, and on the rectangular screen bargraphs.

Creation of the T7 T8 routings

The T7 T8 *In-grids* are selected in AUDIO/TC.20 (p.31), and displayed in the rectangular screen while pressing the [routing] button. *(v2.1x)*

```
* IN-GRIDS *
 T7    T8
 mic5  Xb
```

• Xa and Xb

The mixdown of T1 – T6 is sent to T7 T8; a '**mix**' icon appears in the left circular screen.

• Any input and Xb *(v2.1x)*

One input (Mic, Line-in or Digi-in) goes to T7, the T1 – T6 mixdown pan-potted to Xb, goes to T8.

• Any input pair

One input pair (Mic, Line-in or Digi-in) goes to T7 T8.

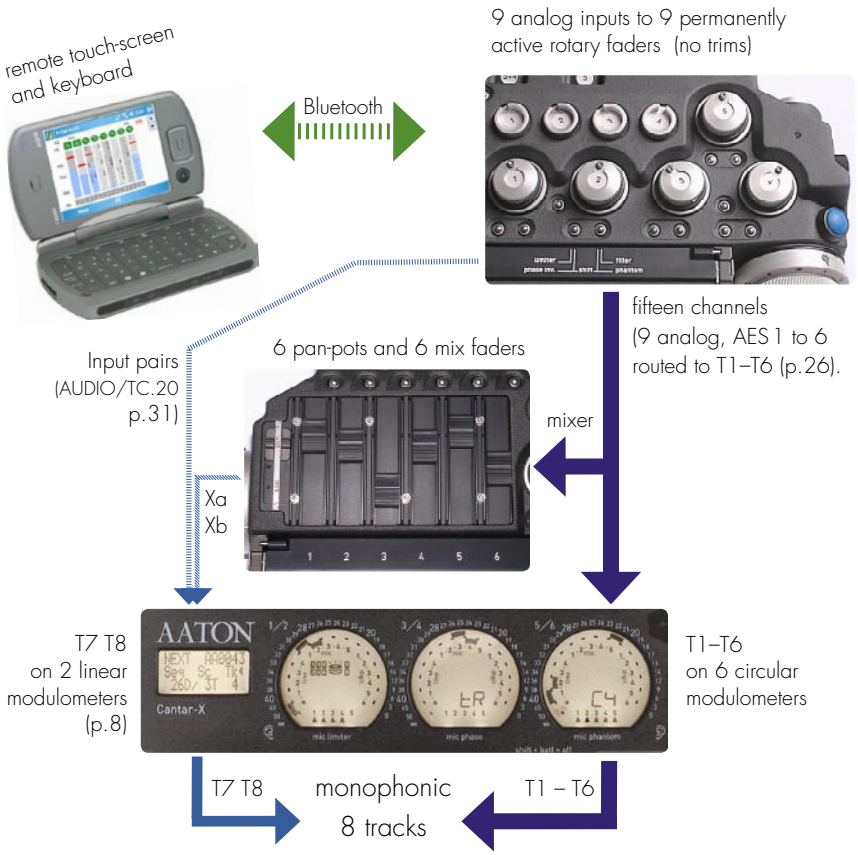
• None

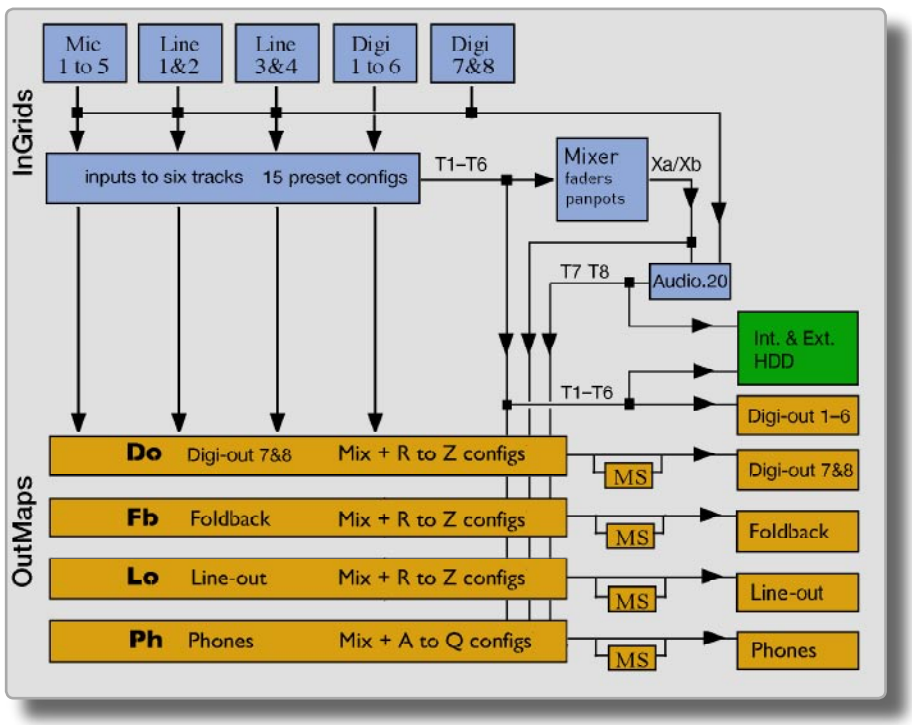
Tracks T7 T8 are disarmed, saving disk space.

T1 – T6

The *In-grids* routings and signal levels of the T1 T2, T3 T4 and T5 T6 track pairs are displayed on the circular screens.

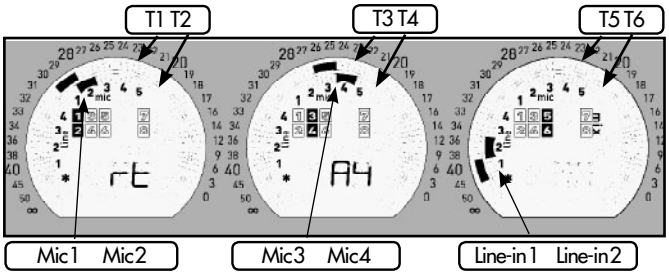
These tracks receive any one of the active inputs: Line-in 1 to 4, Mic 1 to 5 and 'AES' Digi 1 to 6.


remote touch-screen and keyboard
Bluetooth
9 analog inputs to 9 permanently active rotary faders (no trims)
fifteen channels (9 analog, AES 1 to 6 routed to T1–T6 (p.26).
Input pairs (AUDIO/TC.20 p.31)
6 pan-pots and 6 mix faders
mixer
Xa
Xb
T7 T8 on 2 linear modulometers (p.8)
T1–T6 on 6 circular modulometers
T7 T8
monophonic 8 tracks
T1 – T6



Creation of the T1–T6 routings

Rotate the [MainSelector] to IN-GRIDS. Fifteen routing templates (called *In-grids)* can be created and stored in three groups: A1 to A5, B1 to B5, C1 to C5. Their IDs are displayed on the central circular screen.



The [config] crown gives sequential access to all of them in a wink. The last configuration in use is displayed. Select the configuration to be modified, a blinking cursor awaits your orders near the '*' icon of the left circular screen.

For the learning process, it is easier to create a configuration from scratch: first erase an existing one by pressing the [red] button while [jog]-ing through the three circular screens.

Example: to route Mic 1 to Track 1, [jog] five positions up and put the blinking cursor facing the mic segment '1' then press the [black] button to accept it; to route Line-in 1 to Track 5, [jog] the cursor through Tracks 2, 3, and 4 until you land on Track 5 (odd tracks are on the outer circle, even tracks on the inner circle). Go to the pixel opposite Line-in 1, accept with the [black] button; reject with the [red] button.

Note: As soon as an AES Digi-input is selected in a routing configuration, the Digi 1-6 input icons start flashing to remind you to turn the digital power 'ON'. AES SRCs* consume110mA at 48kHz and 200mA at 96kHz, it is wise to turn them 'OFF' if they are not in use (see AUDIO/TC.22 'Digi Power', p.31). *The Sample Rate Converters translate any incoming AES sample rate, e.g. 44.1kHz; to the Cantar internal sample rate, e.g. 48048Hz.

T1–T6 routing check and modify

In REC, you can silently check the active *In-grid*: ***PUSH*** the [SoloMix **Pan**] slider to the battery side, and press the [routing] button.

While in REC, for the protection of the recording's integrity, you can't select another configuration but you can nevertheless do it on purpose: go to PPR, press the [routing] button, rotate the [config] crown to select a new configuration and go back to REC.

Since the pre-record buffer gives you up to 35 seconds to act, you are not hard pressed... not one single audio sample will be lost between the two audio files.

T1–T6 instant (dis)arming

Monophonic files don't waste space by recording empty tracks as is the case with polyphonic files. It is wise to momentarily disarm a track when there is no use for it. Go to TEST, press [shift] [track-solo] of the unwanted track. Its monitor is muted, and to remind you this track is disarmed, its track number square icon is blinking and its modulometer is dashed to make it less visible but still usable.

Disarmed tracks are not rearmed by passing through STOP, you must pass over IN-GRIDS, or turn 'OFF' the power.

M/S Declaration

If two tracks carry an M/S pair entered on say Mic 3 and Mic 4, use the [black] button to activate the '**m-s**' icon attached to these two tracks while passing over it (see pic.). The suffix of the files carrying M/S tracks will show a hyphen '**–**' instead of an underscore '_'.

(Titan3, the auto-conforming tool (p.49), must carry the cantar.tsc file to handle the hyphen flagged suffixes).

Being M/S declared, these files are monitored as L/R stereo tracks in the monitor outputs and in the mixdown (see 'Pan-pots', p.21).

Majax (p.49) can decode and replace M/S pairs with L/R pairs for export to editing machines (e.g. Avid) which can't decode M/S stereo.

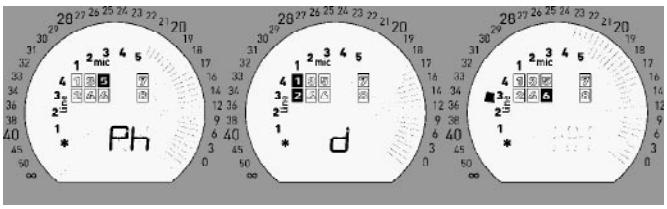
Sixteen Tracks (two Cantar-X2s)

To impose the very same sampling rate frequency and phase on two *recorders operating in parallel* like one single sixteen track machine, enter a Wordclock signal on the SubD 15 Pin-4, and select a 'WC' prefixed sampling rate in AUDIO/TC.01 'Sample Rate'. If you select the wrong sampling rate, 'Wordclock SampleRate mismatch' is displayed on the rectangular screen. If the Wordclock reference is missing, 'Wordclock input missing' is displayed.

So Solos for the phones	Lo Line-out pair
Ph Phones pair,	Do Digi 7/8 ouput pair
Fb Foldback pair	Digi 1–6 (AUDIO/TC.21)

The 3 Screen monitor map

Here is where the Cantar three screen lay-out is at its best. Audio signals going to the left ear are displayed on the left circular screen, signals to be listened to in mono are displayed on the middle circular screen, and those going to the right ear are displayed on the right circular screen. The middle circular screen does not represent a wired output but the 'mono' effect resulting from the routing of a signal to both the left and right outputs.



- Track 5 goes to the left side, Track 1 goes to both sides (mono listening), and Track 6 goes to the right side.
- Line-in 3 goes to the right side.

Map creation

The [MainSelector] six o'clock position gives access to create monitor maps.

Since headphones, Line-out, Foldback and Digi-out carry a left and a right channel each, they can all be set in the same manor. The explanation below concerns the headphones, but it is applicable to the others as well.

Tracks to monitors

Rotate the [monitor] crown to **Ph**. '**Ph**' appears on the left circular screen. Rotate the [config] crown to get **'d'** on the middle circular screen. The black blinking cursor now pinpoints an audio source. [jog] the blinking cursor to the T5 square on the left circular screen, press the [black] button to confirm, Track 5 is now linked to the headphones left side ([red] button to reject), the blinking frequency increases to acknowledge the link. Then [jog] to T1 on the middle circular screen, press the [black] button to confirm you are linking Track 1 to both the left and right sides of the headphones (same for Track 2). Then [jog] to T6 on the rightcircular screen, press the [black] button to confirm you are linking Track 6 to the right side of the headphones.

'Inputs' direct to 'monitors'

Any input, *even if it is not routed to a track,* can be directly routed to the monitor outputs. While the blinking black cursor runs on the inner ring of the circular screen, it points out the input (Mic 1 to Mic 5, Line-in 1 to Line-in 4, Digi-in 1 to Digi-in 6) to be possibly routed to the left/both/right ears. [jog] the cursor throughout the ring and 'link' the facing input to an 'ear' by pressing the [black] button.

Check / Select a monitor map

Check

In TEST, PPR and REC, with the [**Solo**MixPan] slider pulled-Out (see 'verbatim' below), press the [routing] button with the thumb and rotate the black [monitor] crown to check the currently active *Out-maps* of each monitor output displayed on the three circular screens.

Select

In the same way you can on-the-fly select a different *Out-map*. While on a given monitor output, rotate the silver [config] crown to browse its available *Out-maps*. The active map is the one displayed when releasing the [routing] button. Selecting a different *Out-map* while you are in REC doesn't affect the integrity of the recording.

Verbatim

The [SoloMixPan] is a three position slider but Cantar currently uses only the Solo and Pan positions. The Mix position is reserved for a future software version allowing the correction of the original Xa · Xb mixdown during the playback.

Here is a memotechnic proposition to help you memorize the [SoloMixPan] slider position for routing purposes.

- Pushing the slider toward the ***mic inputs*** allows changes to the ***inputs to tracks*** *In-grids*.
- Pulling the slider toward the ***operator*** *ears* allows changes to the ***monitoring*** *Out-maps*.

Grouped in banks accessible from the black [monitor] crown, twenty six *Out-maps* are stored for the Digi-out, Foldback, Line-out, and Phones pairs.
The eight tracks, nine analog inputs and six digi-inputs (recorded or not) are independently routed to these output channels.

Rotate the [monitor] crown over the **Do**, **Fb**, **Lo**, **Ph** positions, and rotate the silver [config] crown over 'MX, A, B, to Z': all the stored *Out-maps* are instantly and logically accessible (p.7).

Digi7/8-out = Do
Do Mx Do R to Do Z
Do Mx = Xa · Xb in stereo, plus nine user created R to Z *Out-maps*. The digital-out signals go to the AES ports 7&8.

Foldback = Fb
Fb Mx Fb R to Fb Z
Fb Mx = Xa · Xb in stereo, plus nine user created R to Z *Out-maps*. The level of this pair can be set by AUDIO/TC.06 'Foldbck Lvl' or online by a CantaRem slider.

Line-out = Lo
Lo Mx Lo R to Lo Z
Lo Mx = Xa · Xb in stereo, plus nine user created R to Z *Out-maps*. The level of this pair can be set by AUDIO/TC.05 'Lineout Lvl' or online by a CantaRem slider.

Phones = Ph
Ph Mx Ph XA Ph Xb Ph XC Ph D to Ph Q
The headphones get four favorite settings: Ph Mx = Xa · Xb in stereo, Ph Xa = Xa only, Ph Xb = Xb only, Ph Xc = both Xa · Xb in the center, plus twelve user created *Out-maps*: Ph D to Ph Q.

Solos = So
So M1 So M2 etc. So L3 So d1
This position is not concerned with the mapping since it opens a direct SOLO connection to ALL of Cantar's in and out ports.

It is placed near the Phones **Ph** monitor position since the last verified port, kept in memory, is immediately dispatched to the phones when coming back to the **So** position.
As an alternative to the **So** position, the ***Mic-inputs*** can be instantly solo-ed by pressing their [so-fil-tom] buttons, and the *Tracks* by pressing their [track-solo] buttons.

Digi outputs 1 to 8

The use of the AES outputs is recommended to send audio signals to the exyernal world: total transparence, no interference prone cables.
Connect them to HD video cameras featuring AES inputs (such as the Sony HD-Cam F900-SR), or to an SDI camera equipped with a miniature AES-to-Analog converter.
The eight AES outputs are separated into two groups.

- *the Digi 1 2, 3 4, 5 6 pairs* transmit either
  - *Tracks T1–T6*
  - *Mics 1-5 & Line-in 1*

This later option lets you use the Cantar's high quality preamplifiers/limiters to send audio signals to an external mixer and re-enter them through the Digi 1 to Digi 6 inputs to record them. (see AUDIO/TC.21 'Digi1-6 Out').

- *the Digi 7 8 pair* transmits either
  - *Tracks T7 T8*
  - any other audio signal combination, including the mix-down, as selected in **Do** (see opposite column).

Digi power

The AES converters of the Digi-in/out circuits consume 110mA at 48kHz and 200mA at 96kHz. It is wise to turn them 'OFF' if they are not in use (AUDIO/TC.22 'Digi Power'). As soon as you select a Digi-input or output in a routing configuration, the Digi 1 to Digi 6 input icons and the track icons start flashing in the circular screens to remind you to turn 'ON' the digital power.

20 T7T8 In-grids*
21 Digi 1-6 Out-maps
22 Digi in/out Power
01* Sample-rate
02 Bit-depth
03 Reference Tone level
04 Talkback mic routing
05-06 Line-out/Foldback level
07 Max mixer gain
08 Pre-record duration
09 Balance fader lock
10 Mic fader linking
11 Scene/Take templates
12 AutoSlate trig channel
13 Record by LTC
14 TC Source
15 Camera TC fps
16 LTC generator output
17 LTC User-bits
18 Record-Run TC init.
19 Operator TC init.
23 CantaRem com.
24-31 Slider assign

20* T7T8 InGrid

None Xa & Xb *MicN & Xb* *LineN & Xb* *DigiN & Xb* *Mic1 & 2* Mic3 & 4 *Line1 & 2* Line3 & 4 *Digi1 & 2* *Digi3 & 4* *Digi5 & 6* Digi7 & 8

The selected T7 T8 INGRID appears on the rectangular screen while pressing the [routing] button. *(v2.1x)*

21* Digi 1–6 Out

T1–T6 Mic1–5+Lin1

On top of their individual routings set with IN-GRIDS, the Mic 1 to Mic 5 plus the Line-in 1 signals can be sent to the Digi 1-6 outputs. After treatment by a digital mixer/router, they may be sent back to Cantar and routed as standard Digi-inputs.

22* Digi Power

Off On Digi Loop (Sept. 2008)

'Off' saves 110mA. Routed but not powered, the Digi 1 to Digi 6 icons of the circular screens blink as a reminder to turn 'On' the Digi-in/out sample rate converters. **'Digi Loop'** triggers the powering of the AES converters and disables the internal direct connection from the playback tracks to the Digi-inputs when in BLUE-TEST and BLUE-REC.

.

01* Sample Rate

44100 47952 48000 48048
88200 95904 96000 96096

For Wordclock slaving (Cantar-X2 only), select the WC prefixed values, e.g. **WC 48000**, which are the same as the non-WC rates (see 'Sixteen Tracks', p.27).

* All indexes will be reshuffled in the next firmware release.

02 Bit Depth

16-bit 24-bit

Select 16-bit if you know the final mix will be done in 16-bit. Dither or truncate to 16-bit from native 24-bit tracks is available when backing-up the mixdown. See BACKUP.05 'T7 T8 Trtmt' (p.39).

03 Tone Level

-20dBFS -18dBFS Off

See 'Reference Tone generator' (p.22).

04 TalkbackMic (routing)

Off Line-out Foldback Lo+Fb

[black] continuous: TB mic to *left* channel(s), [black] then [black] continuous: TB mic to *right* channel(s), [shift] [black] continuous: in REC, TB mic to all tracks.

05 Lineout Lvl

0 to -94dB Mute

The Line-out level is [jog] adjustable from 0 to -94dB and mute. The track modulometer being at 0dBFS, the Line-out delivers a +8dBu signal; this means that a -18dBFS reference tone delivers a -10dBu output. This is compatible with HD camera Line-in levels. A Line-out, two track, +12dBu gain, transformer-isolated accessory is available (p.50).

06 Foldbck Lvl

0 to -94dB Mute

Both Line-out and Foldback gains can be controlled from the CantaRem sliders (p.46).

07 MixGain Max

0dB +6dB

In +6dB mode, the 0dB mark is on the indentation.

08 PreRec Dur

1 to 35 sec.

Up to 35 seconds @ 8 tracks, 24-bit, 48kHz.
Up to 17 seconds @ 8 tracks, 24-bit, 96kHz.

09 BalanceLock (slaved faders)

Unlocked Locked

See 'Mic Coupling' (p.17).

10 Mic Links

1+2 3+4 1+2+3 1+2+3+4 1+2+3+4+5

These are the four mic-preamp ganging groups. The factory default linkage is '1+2 3+4' which can be (de)activated with the two buttons in-between the rotary faders. Mic1's fader becomes the master; the other(s) control the ±12dBu balance.

11 ScTk Templt

nnnA/nnA.nn CCCCCCCC.CC

The nnnA/nnA.nn template fits the mostly used Sequence/Scene system. The other one is totally open, giving the operator maximum flexibility ('Scene and Take', p.18).

12 Slate Chanl

Off Mic1... Mic5

Line-in1... Line-in4 Track1... Track8 (Cantar-X2 only)

See AutoSlate detection, p.22.

13 Rec by LTC *see Remote Roll, p.20*

Inactive Active

In PPR, LTC input running, Cantar checks the TC coherence for 3 seconds then goes to record. While checking the validity of the LTC signal, the audio is kept in a buffer, the audio file begins right on the running LTC. Frozen LTC input stops recording. If the LTC input disappears, recording is maintained, no risk of interruption caused by radio transmission drop-outs.

14 TC Source

Int.Clock Ext.Clock

On 'Internal Clock', Cantar is *THE* master-clock. On 'External Clock', it is slaved to another timecode source (p.14).

15 LTC Rate

24FPS 25FPS 29.97DF 30FPS 23.98NDF-A 29.97NDF-A 23.98NDF-B 29.97NDF-B 23.98NDF-C 29.97NDF-C

In the -0.1% NTSC slow-second world, an A, B or C time stamping method must be selected depending on the type of editing machine that will be used (p.15).

16 LTC Gen Out

On Off

Note that in PLAY the LTC output carries the TC and fps of the played files, not the project time and frame-rate.

17 LTC Ubits

Date Filetag TapeRef Freeform

Filetag, TapeRef, and Freeform entries are not enabled.

18 RecRun Init

01h00m00s

Time jumps one hour at each rectangular screen bottom line opening. 'Rtc' (record-run) is activated for the recording session and stays there until another TC Source is selected; in this case the clock goes back to its default free-run mode.

19 OperTc Init

01h00m00s

The operator entered TC becomes the next recording session time reference. 'Otc' is displayed in the rectangular screen. It is disabled as soon as free-run TC from an external source jams the internal clock.

23 CantaRemCom

Inactive Active Forced

'Active' makes CantaRem (p.46) control Cantar until its cable is disconnected from the SubD15 ASCII port. 'Forced' allows CantaRem to control the STOP, TEST, PPR and REC functions when the MainSelector is physically set to the PPR position.

```
AUDIO/TC  28
Slider A5
Mic1>Line1&2
```

24 Slider A1
31 Slider A8

The assignment of the CantaRem sliders to the Mic and Line-in faders, to the mixdown sliders, plus the Line-out and Foldback outputs can be performed from either the CantaRem keys or from these positions (extended out to '32 Slider B1' to '39 Slider B8' when using two CantaRems).

01 Disk (un)mount
02 Backlight
03 View Fader dB
04 Record beeps
05 Clip detection beep
06 Lack of ext. clock beep
07/08 Beep routing/level
09 Meter ballistics
10 Peak hold duration
11/12 Batt1/Batt2 alert
13 HDD Power Down
14 Serial Com. port
15 Factory Reset
16/17 Save/Load Setup
18 Max File Size
19 Temperature Control
20 System Time
21 System Date
22 Equipement IDs
23 License key
24 Software version info
25 Software install

01 Disk Status

Unmount Mount

Two CPUs can't simultaneously control Cantar's drives.
Unmounting the internal HDD and DVD-RAM drives puts them out of the control of Cantar's CPU while keeping them powered. A Firewire connected PC or Mac can then see them as standard devices on which to edit the audio files and transfer software updates.
Using a Mac laptop you must install 'WriteUDF' to be able to modify the metadata on a DVD-RAM disk in the Cantar burner (see Majax Q/A, p.49).
WARNING: before disconnecting the Firewire cable, FIRST, eliminate the 'disc' icon from the PC or Mac desktop, THEN disconnect the cable. Ignoring this rule will trigger a warning message, but it will be too late; the audio files may already be corrupted.

MAC-OS Ejecting the Cantar Disk *WINDOWS*

02 Backlight

0% to 100%

In bright sunlight, save power by turning off the backlight. To insure visibility whatever the startup lighting environment, the rectangular screen doesn't go down to 0%, this offset is maintained throughout the adjustment range.

03 Display dB

On Off

While adjusting a fader, its dBFS value is displayed as well as the other faders found in the same Mic, Line-in or Mixer bank.

04 Record Beep

None Start only Start+Stop

Single beep on 'start', double beep on 'stop'.
The double beep is useful to warn you when the video camera stops, while recording in Remote Roll by LTC.
It is also a means to tell your boom to keep the mike in the same position since you are still recording the background noise after the director's 'CUT!'.

05 Clip Detect

Beep On Beep Off

06 No Ext TC

Beep On Beep Off

Activated if the external clock is missing while in External Clock mode. The beep is automatically disabled while recording 'w' (wild track) takes.

07 Beep Route

Phones, Ph+Line-out, Ph+Foldback, Ph+Lo+Fb

08 Beep Level

0dB to -60dB

09 Meter Speed

1 Fast 2 3 Med 4 5 Slow

Select '5 Slow' in low temperature conditions.

10 Peak Hold (peak hold duration)

0.5 sec to 5 sec

11 Batt1 Alert 12 Batt2 Alert

10.8 Volt to 14.0 Volt

Each battery can be set to its own alert level. Automatic switch-over occurs 300mV below the battery alert level. Once one or both batteries' voltage drops below the alert level, a two beep alarm is sent to the headphones.
NiMH battery alert should be set to *10.8V* (10.5V switch-over), and Li-Ion alert to *12.7V* (12.4V switch-over).

13 HDD Pwr Dwn

Aftr 1min to Aftr 255min

In STOP, the HDD eats half of Cantar's power, it is wise to put it to sleep. While in sleep, the 'three-platter' icon blinks. Go to TEST to wake-up the HDD; it will be up to speed within 3 to 10 seconds, the pre-record buffer hides this speed ramp-up. Cantar's cold start from a totally un-powered machine to recording is a blazing 2 to 3 seconds.

Note: during IdleCopy the HDD doesn't go to sleep.

14 Serial Com

Factory Bluetooth

'Factory' for maintenance techs, 'Bluetooth' for PDAs.

Note: on Cantar-X2, the Ethernet interface is permanently active.

15 FactryReset

No Yes

All menu parameters are reset to their factory default.

16 Save Setup (user's settings)

No Yes

All of Cantar's physical settings (IN-GRIDS, OUT-MAPS, TECHSET and AUDIO/TC preferences, mic filters, etc.) are saved in XML files on the external HDD (or the internal HDD if there is no external drive connected). To automatically ensure the uniqueness of the Setup files, each one is named by the filetag of the last recorded take, e.g. AB1234+A.xml. As many Setups as desired can be saved, keep them for later use in the internal HDD. Copy them onto a laptop before returning your Cantar to the rental house. Next time you rent a Cantar, you can re-import those Setups and be ready to go. A great timesaving operation!

Tarkan-II (May 2008), will be able to prepare Setups while in offline mode.

Note 1: Setups can be viewed *(but not modified!)* by dragging them onto an internet browser. Provided you keep the .xml suffix, you can replace the 'filetag-made' name with a more descriptive one.

Note 2: If you encounter an operational problem, immediately perform a 'Save Setup' and send it to cantar-support@aaton.com as an attachement to your mail explaining the problem; this will help maintenance engineers provide you with a solution.

17 Load Setup (users' settings)

No Yes

Open the 'Load Setup' screen, [ok]. Cantar first looks for XML files in the external HDD. Select the file you want to load, [ok]. Press [shift] to reboot.

18 MaxFileSize

260MB 690MB 2GB 4GB

The current file is closed and the next one opened when the set limit is reached, without losing a single sample. Four lengths are available: 260MB (1 track for 30 min @ 24-bit/48kHz), 690MB (for 700MB CD-Rs), 2GB (FAT32 basic limit), 4GB (Indaw max file size). You also have the choice of triggering the jump yourself by swiftly changing from REC to PPR and back to REC.

19 Show Temp

• Lcd+02

The heater option displays the circular LCD's temperature that the heaters control. It takes about fifteen minutes to reach the +2°C to +4°C equilibrium in a -15°C environment. To save power, Cantar should be in a carrying bag, preferably with insulation. Also, it is recommended that you set TECHSET.09 'Meter Speed' to '5 Slow'.

• Hdd-12

This is the Cantar internal temperature. Below -5°C, it is recommended to replace the standard Travelstar HDD with a low temp disk such as the 40GB Hitachi Endurastar or a solid state disk (p.41).

Below -15°C (and higher than 5,000m altitude, or very bumpy environments), use a solid state disk such as the Samsung MCAQE32G5APP-0XA 32Gbyte 2.5" SSD mounted on an Aaton Firewire-IDE bridge and shuttle tailored to it. The temperature is displayed on this screen until quitting this item.

20 System Time

00h32m24s

Enter the time from your watch (±5 minutes), especially if you just started working in a new time zone. The system's date (which relies upon hour and minutes around midnight) is used to sort the workdays, it should not be confused with the timecode which is used for syncing picture and audio.

21 System Date

2004y04m22d

The system date is used to create the folder name (YYYYMMDD) containing the files for that workday. Note that the workday folder can contain hours past midnight, if the recording session is not interrupted (e.g. turning 'OFF' the Cantar). The workday is also used to fill the default MMDD name of the TapeRef field.

22 Hardwr IDs

SN 0520, MoBo CM5 (CM3), Preamp SL1 (SL0), Ether ET1 (none), Conv AD5 (AD3)

Cantar's Serial number, Motherboard, Preamps, Ethernet interface, A/D converter versions. Keep these labels in mind when contacting Aaton's technicians.

23 License Key

Unlimited 24 Days

Protection against unauthorized use: Cantar goes to 'general freeze' after a given number of calendar days. The key can be activated or deactivated by a CMU software key emailed by Aaton. If 'Unlimited' appears, go no further, your Cantar is set to work forever.

24 Softwr Ver.

v2.11 v2.12b (beta)

The current software copy is stored in Cantar's EEPROM, no need to keep it in the HDD. You should not keep more than three versions; erase the old ones. To install a new version, see below.

25 Softwr Load (new software installation)

No Yes

As a registered Cantar owner, get the latest version from http://soft.aaton.com/swcantar/. Put the file (can-xxx.flb) on your Mac/PC desktop.

Instructions

please read completely before proceeding

1 Connect a cable to the Cantar Firewire socket while it is *unpowered* (p.5).

2 To avoid any power interruption during the following operations, *activate both on-board fully charged batteries* by simultaneously pressing the [batt 1] and [batt 2] buttons for 3 seconds. A loss of power will prevent Bios re-installation; 'ERROR Num 1B XILINX' will be displayed, meaning 'Return Cantar to the factory'.

3 *First* unmount the HDD in TECHSET.01 'Disk Status' *then* connect the Firewire cable to the computer. The Cantar HDD icon will be displayed on the computer's screen.

4 Copy the can-xxx.flb file to the root of the Cantar HDD. *NEVER install a version lower than 1.78.*

5 Dump the Cantar HDD icon out of the computer, then disconnect the Firewire cable (see the warning in TECHSET.01 'Disk Status', p.32).

6 Set TECHSET.01 'Disk Status' to 'Mount' the internal HDD; this is done when the 'three-platter' icon is no longer blinking.

7 Set TECHSET.25 'Softwr Load' to 'Yes'.

8 Select the desired version, [ok]. For safety, all controls are disabled during this one minute operation. Do NOT touch anything until 'Success Press Shift' is displayed.

9 Press [shift] to finish the installation and shut down Cantar. Set the [MainSelector] to STOP, and restart.

10 Cantar is protected from the installation of corrupted software. Go to TECHSET.24 'Softwr Ver.'; if the new version doesn't show up, that's all the message you will get, something went wrong, re-download the software from the Aaton site and re-install.

Software Installation from an external disk

Connect a go-between disk to your laptop and copy can-xxx.flb to the disk root. Unplug it and hook it up to the Cantar Firewire port. *Activate both on-board fully charged batteries* by simultaneously pressing the [batt 1] and [batt 2] buttons, then follow steps **7** through **10** above. This method works because Cantar, while installing software, first looks for .flb files in the root of the external disk.

01 Select Project Name
02 Create New Project
03 HDD in Use
04 Disk Formatting
05 Scan Disk
06 Delete files
07 Full Title ...
13 Picture Format
14 Column layout
15 A-Column 02 ...
29 A-Column 16

01 ProjectName

AACANTAR EDEN-END

Max. eight characters. A factory preloaded project, 'AACANTAR', is stored on the internal HDD. If the disk has been erased by the rental facility, 'No Project' is displayed. Going directly to REC creates a provisional AACANTAR project folder.

02 New Project

SHADOWS_

A HDD must be connected. The bottom line of the rectangular screen displays the projects already stored. Press [ok] to create a NEW project (8 alpha/numeric characters), a triangle points at the character to be set. [jog] to select a character then press [>] or [<] to go to the next letter. Name entered, press [ok] and go to REC to immediately validate it by recording a very short file.

03 HDD in Use

Int.HDD Ext.HDD Int+Ext.HDD

Audio files can be recorded on internal or external HDD or both simultaneously. When listening to recorded files, only the internal drive plays. To listen to files on the external drive, switch to 'Ext.HDD' and don't forget to switch back afterward.

If external and internal HDDs are simultaneouly recording, the message panel displays the lowest remaining disk space in Mega Bytes.

Q: I connect an external HDD and wait for its activity LED to turn green. I selected SESSION.03 'Int+Ext. HDD' but the external HDD doesn't mount!

A: Wait for the external 'three-platter' icon to stop blinking in the middle circular screen, then go to 'Int+Ext. HDD'. If Cantar still doesn't see the disk, most probably it is not formatted with a FAT32 primary partition. Format it with Cantar (see below).

04 Disk Format

HDD DVD-RAM

Almost identical operations for HDD and DVD-RAM.

HDD erasing/formatting (auto-FAT32)

Since Cantar HDDs do not use a proprietary format, they are directly accessible by both Mac and PC. Each disk must be formatted as 'One primary partition' under FAT32.

Internal HDD: Open the internal HDD compartment (a ten second operation) and disconnect it. Following the instructions below, re-connect it to Cantar as an external HDD. This is protection from accidental erasure by idle fingers.

External HDDs: Firewire connected, Cantar will format them up to 127GB which is Microsoft's marketing limit for FAT32. To format a larger disk, see 'tutorial: disks' (p.41).

Instructions:

please read completely before proceeding

1 With no external HDD plugged-in, go to SESSION.04 'Disk Format', [ok], 'Shift+Red' is displayed.

2 Press and hold the [shift] [red] buttons while connecting the external HDD to Cantar, and continue to press until 'Formatting' is displayed on the rectangular screen, then release both.

To avoid connection mishaps, plug the Firewire cable into the Firewire socket and hold it with the retaining screw while Cantar is not powered (p.5), then, at the last minute, carefully plug the other end of the cable into the HDD.

3 'Done' is displayed when finished. A 'three-platter' icon is displayed on the middle circular screen. Go to STOP.

Note: HDDs are now low cost consumer products and their life span ranges from one to three years. Formatting a disk doesn't protect you from dead clusters. Regularly ***scan*** your disk(s), see SESSION.05 'Scan HDD below; even if it only detects ***one*** defective cluster, immediately discard the drive.

DVD-RAM formatting (auto-UDF 1.5)

Cantar can record onto FAT32 DVD-RAMs but for Mac/PC interchangability, it only offers to format them under UDF 1.5.

Instructions:

please read completely before proceeding

1 With Cantar powered, go to SESSION.04 'Disk Format', press [ok], 'Shift+Red' is displayed.

2 Insert a DVD-RAM in either the external or internal burner. Before the 'one-platter' icon is displayed, press [shift] [red] together. Keep them pressed until the 'Formatting' message is displayed on the rectangular screen.

3 'Done' will be displayed when the format has finished. The 'one-platter' icon appears on the right circular screen to indicate the DVD-RAM is ready for use. Go to STOP.

Note: To work with a DVD-RAM on a Mac, see p.41. To play it on a DV40/824, contact Aaton.

05 Scan HDD

Int.HDD Ext.HDD

Scanning an 80GB HDD may require two hours to complete. At the end of the scan, the message should be 'No error'. If 'One error' appears, immediately copy all of your files and discard the disk. Remember that a hard jolt can force the disk heads to crash and scratch the surface resulting in one or more dead clusters.

If for some reason you must perform an urgent REC while scanning the internal disk, abort the scan by pressing [esc] for a few seconds until 'aborted' is displayed.

06 Del. Access

No Yes

This opens access to file deletion. To reduce disk fragmentation, file deletion only works on full workdays. Use a laptop to perform the *not recommended* erasure of individual files...

Select 'Day to Del' The cursor (black triangle) moves to the bottom, [jog] to select the day to be deleted, then [ok]. The bottom line will display 'ScanningDay', then the cursor goes back to 'Day to Del'. [jog] to 'Del Int.HDD' or 'Del Ext. HDD' then [ok]. [jog] to 'Yes nnnMB', then [ok]. Once the files have been deleted, 'No Files Found' is momentarily displayed, then the bottom line changes to 'No 0.0MB'. [ok] returns to 'Day to Del', [esc] goes back to SESSION.01 'ProjectName' where another project can be selected.

Sound-Report – Headers

Eight header items – FileType, TapeRef, ToneLevel, Sample rate, Bit-depth, FPS, Date and Media – are automatically filled with the recording parameters, while seven others (see 08 to 14 below) carry operator entered data. Multiple changes to each header item are allowed per workday. If one header item changes, a new PDF and ALE page is started with this information.

07 Full Title

For consistency the 8 character Project name is automatically inserted in the header before of the operator entered Full Title. (max: 39 chars.)

08 Production (max: 30 chars.)

09 Director (max: 25 chars.)

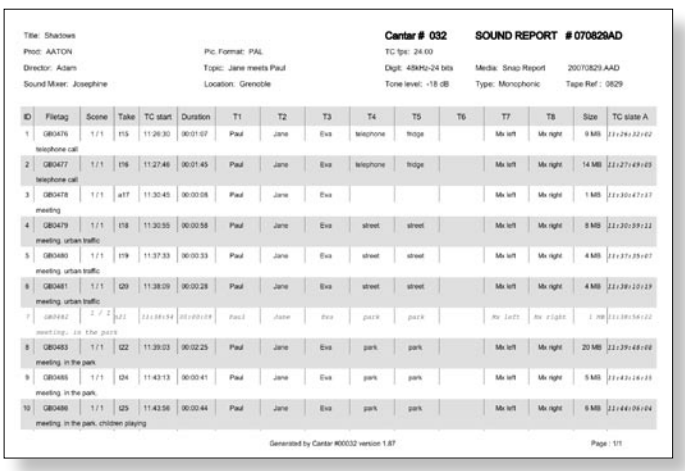
10 Sound Mixer (max: 25 chars.)

11 Location (max: 25 chars.)

12 Day's Topic (max: 19 chars.)

13 Pic Format (PAL, NTSC, HD1, HD2)

Note: to clear each of these fields individually, press [shift] [esc].



Title: Shadows
Prod: AATON
Director: Adam
Sound Mixer: Josephine
Pic Format: PAL
Topic: Jane meets Paul
Location: Grenoble
Cantar # 032
TC fps: 24.00
Digit: 48kHz-24 bits
Tone level: -18 dB
SOUND REPORT # 070829AD
Media: Snap Report 20070829.AAD
Type: Monophonic Tape Ref.: 0829

ID	Filetag	Scene	Take	TC start	Duration	T1	T2	T3	T4	T5	T6	T7	T8	Size	TC slate A
1	QB0476	1/1	t15	11:26:30	00:01:07	Paul	Jane	Eva	telephone	fridge		Mx left	Mx right	9 MB	11:29:32:02
	telephone call														
2	QB0477	1/1	t16	11:27:46	00:01:45	Paul	Jane	Eva	telephone	fridge		Mx left	Mx right	14 MB	11:27:49:03
	telephone call														
3	QB0478	1/1	a17	11:30:45	00:00:05	Paul	Jane	Eva				Mx left	Mx right	1 MB	11:30:47:17
	meeting														
4	QB0479	1/1	t18	11:30:55	00:00:58	Paul	Jane	Eva	street	street		Mx left	Mx right	8 MB	11:30:39:11
	meeting, urban traffic														
5	QB0480	1/1	t19	11:37:33	00:00:33	Paul	Jane	Eva	street	street		Mx left	Mx right	4 MB	11:37:39:07
	meeting, urban traffic														
6	QB0481	1/1	t20	11:38:09	00:00:28	Paul	Jane	Eva	street	street		Mx left	Mx right	4 MB	11:38:10:19
	meeting, urban traffic														
7	QB0482	2/1	t21	11:38:54	00:00:09	Paul	Jane	Eva	park	park		Mx left	Mx right	1 MB	11:38:56:22
	meeting, in the park														
8	QB0483	1/1	t22	11:39:03	00:02:25	Paul	Jane	Eva	park	park		Mx left	Mx right	20 MB	11:39:48:00
	meeting, in the park														
9	QB0485	1/1	t24	11:43:13	00:00:41	Paul	Jane	Eva	park	park		Mx left	Mx right	5 MB	11:43:16:15
	meeting, in the park														
10	QB0486	1/1	t25	11:43:56	00:00:44	Paul	Jane	Eva	park	park		Mx left	Mx right	6 MB	11:44:06:04
	meeting, in the park, children playing														

Generated by Cantar #00032 version 1.87 Page : 1/1

Sound-Report – Columns

User configurable, they carry take specific data.

14 Col Layout

Layout-A Layout-B Layout-C

Three operator created custom layouts can be selected; they are stored in Cantar's memory and can be modified by [jog]-ing through the column/field linking positions (see SESSION.15 below). The first letter identifies which layout (A, B or C) the selected column is modifying (e.g., A-Column-02, B-Column-02, C-Column-02).

15 A-Column-02 to 29 A-Column-16

[INS field] [DEL field] Blank Filetag
Scene Take TC Start TC End Duration
TC Slate A TC Slate B TC Slate C Track rank
Tracks used File Size User-bits

The column '01' field carries the file recording order used to sort the events, it is not modifiable,

To assign a different field to columns 02 to 16, press [ok] and use the [>] or [<] to select one of the fields above.

[DEL field] eliminates the field assigned to the selected column and shuffles the fields on the rightside to the left; '**none**' is displayed on the last column. If you want to activate a '**none**' column press [ok] to change it to '**blank**' then select any field for it.

[INS field] inserts an empty placeholder ('**blank**') that can be filled with a specified field; other fields are pushed to the right... provided there is at least one '**none**' column on the far right.

Track rank represents Track 1 through Track 8.

Sound-Report – Delivery

Name composition

In order for the latest entries of the day to be taken into account, the most recent report overwrites the former one. Two independent PDFs are created: '**All**' contains all of the take-types (t, p, w, a, n), '**Wild**' contains the 'w' takes only. The name (max: 8 char.) of the report indicates the treatment applied to the files.

For example, **071224AR** is made of:

- **071224,** the YYMMDD of the calendar day.
- **A** = all takes, **W** = wild takes only.
- **D** = Direct multi-mono, **N** = Native poly, **R** = Rotated poly, **X** = mi**X**er poly.

Actual generation *(see BACKUP chapter)*

- Any time

Go to **BACKUP.11,** contrary to 'Idle Report'**, 'Snap Report'** lets you select **Dir, Nat, Rot,** or **miX** of your choice. Press [ok] to immediately build a Sound-Report and send it to the YY**YYMMDD.AA§** folder (§ = D, N, R, or X) on the drive(s) in use as selected in SESSION.03.

- After 'IdleCopy' is finished

Before [eject]-ing the DVD-RAM or removing the external HDD, set **BACKUP.12 'Idle Report'** to '**Yes**'. The Sound-Report automatically carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the YY**YYMMDD**.AA§ folder, (§ = D, N, R, or X).

- During 'Backup@Call'

Set **BACKUP.13 'Run Backup' to** '**Yes**'. The Sound-Report automatically carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the YY**YYMMDD**.AA§ folder, (§ = D, N, R, or X).

Sound-Report – Notes

1 Stored in the iXML chunk of each BWF file, the operator's comments (max: 200 char.) are used as separators in the PDF print-out.

2 Not yet able to read the iXML chunk, the Avid MCs only have access to the first 40 characters of the comments stored as '*aNote*' in the BWF descriptor line.

3 It takes a little more than one minute to build a twelve page PDF report. A CSV tab-delimited text report for spreadsheet applications is generated, as well as an ALE list for editing machines; one ALE per matching header.

4 The paper size is unified to 21x27.2 cm, this fits both 'A4' and 'Letter' formats.

5 Warning On Mac computers, open the PDFs with 'Preview' (Aperçu), they can't be printed by Adobe Reader nor Acrobat.

01 Save mode
02 Day to copy
03 Track selection
04 T1–TX treatment
05 T7 T8 treatment
06 Media type selection
07 Burn and Check
08 Files to copy
09 File name
10 Media label
11 Snap Sound-Report
12 Idle Sound-Report
13 Clean Polys
14 Run Backup

01 Save Mode

IdleCopy Backup@Call PolyStore

• *IdleCopy*

can be activated any time, the earlier in the day, the better. Parameters excluded by a preceding choice are flagged as 'N.A.' (not applicable). When the internal HDD is not occupied by any other task, i.e. in TEST or STOP, Cantar incrementally copies the files of the day onto a DVD-RAM (external or internal) or an external HDD. By the end of the day most audio files are copied. This is an alternative to the simultaneous recording on both the internal HDD and external HDD. IdleCopy automatically updates archived files; if you modify the metadata of an internal HDD file, its copy is erased and re-saved.

To interrupt the process, go to PPR or press [esc] until 'IdleOp Stop' is displayed in the rectangular screen; the unfinished file copy is deleted. The operation will resume as soon as you go to TEST or STOP. Once IdleCopy has completed, the backup disk goes back to sleep.

DO NOT remove the external HDD or DVD-RAM until the IdleCopy job is completed, see 'Pazienza!' *(p.19).*

Toggling between TEST and STOP displays the remaining disk space in Gigabytes. If, at the end of your next recording, the file is too large to be idle copied within the available backup disk space, **'IdleCopy Full'** is displayed on the rectangular screen. After you [eject] the DVD-RAM, insert an empty one; the backup automatically continues from where it previously stopped.

• Backup@Call

Opens access to the parameters requested for BACKUP.14 'Run Backup'. Note: only trigger 'Run Backup' *at the end of the day* to copy the files onto the external HDD. If you modify a file's metadata after you have saved the file with Run Backup, it will not automatically resave your updated file(s) during the next Run Backup of the day. It is preferable to use IdleCopy which resaves files that have been updated.

• PolyStore

To speed-up the end of day 'Run Backup', PolyStore copies on the internal HDD the provisional 'Poly files' resulting from the treatments done during idle periods and during backup@call on DVDs. From time to time, it is good to clean these poly files from the HDD (see BACKUP.13 'Clean Polys').

02 Day to Copy

2007-02-18

The current day is selected by default. Previous days can be selected too. To simplify archive creation and retrieval, Cantar only copies one day per CD/DVD. Several days can be copied on an external HDD, each day in turn.

03 TrackSelect

T1–T8 T1–T8 (7&8) T1–T6 T1–T6 (7&8) T7 T8

• T1–T8 (7&8) or T1–T6 (7&8)* should be selected only if the tracks T7 T8 carry a mixdown to be added to the iso track backup. **v2.1x and later*

```
BACKUP    03
TrackSelect
T1-T8 (7/8)
```

• T7 T8 is of interest when these two tracks carry the mixdown.

04 T1–Tx Trtmt (x = 6 or 8)

mono-Direct poly-Native poly-Rotate

This iso track treatment is applicable if either T1–T6 or T1-T8 is present in the BACKUP.03 selection.

• mono-Direct leaves the iso tracks in their original form (AB1234_1, AB1234_2, etc.), and puts them in an .AAD folder identical to the Cantar HDD one.

• poly-Native makes long poly files AB1234.PN by interleaving the native iso monofiles while keeping their rank, then stores them in an .AAN folder.

```
BACKUP    04
T1-T8 Trtmt
poly-Native
```

• poly-Rotate is available only if tracks T7 T8 are present in the BACKUP.03 selection; it moves the T7 and T8 iso tracks to the T1 and T2 positions while pushing T1–T6 to T3–T8, and makes a poly file AB1234.PR stored in an .AAR folder.

The poly-Rotate treatment solves the Avid composer inability to put tracks where the editor wants them: for example on a composer the mixdown pair automatically goes to positions 1 & 2 of the audio timeline, unfortunately the T1 and T2 iso tracks of a multitrack recording are automatically put there too! If during the course of his work

the editor decides to import the T1 to T6 original tracks, his machine will kill the mixdown tracks he has been using from day one. Thanks to '**poly-Rotate**', the mixdown tracks (T7 and T8) are moved to T1 and T2 to replace the 16-bit mixdown with the 24-bit originals, while the iso tracks (T1-T6) are pushed to T3-T8.

```
BACKUP    04
T1–T8 Trtmt
poly-Rotate
```

05 T7T8 Trtmt (mixdown treatment)

Mono Native Poly Native Poly16Trunc Poly16Dith

Only applicable if T7 T8 shows in BACKUP.03 'TrackSelect'. This treatment can perform the reduction from 24-bit to 16-bit, and the conversion of the T7 T8 monofiles into a polyphonic file.

- **Mono Native** (24/16) - changes nothing relative to the original 16-bit or 24-bit files.
- **Poly Native** (24/16) - interleaves T7 T8 at native bit-depth.
- **Poly16Trunc** - interleaves T7 T8, truncates 24-bit to 16-bit.
- **Poly16Dith** - interleaves T7 T8, dithers 24-bit to 16-bit.

```
BACKUP    05
T7 T8 Trtmt
Poly16 Dith
```

Note1 : dithering offers a slightly better quality than plain truncation but the process requires twice as much time!

Note2 : treatments automatically convert 96kHz to 48kHz.

Note3 : treatments *(04 and 05)* associated with a *(03)* track selection are retained from one recording session to the next; they are lost as soon as the *(03)* menu bottom row is opened.

06 Media Type

CD±R 700MB Ext.HDD DVD-RAM
DVD±R 4.7GB DVD+R 8.5GB

It can take more than twenty seconds for a DVD or DVD-RAM media to be checked before its 'one-platter' icon appears in the right circular screen, be patient.
Files can be copied on both FAT32 and UDF1.5 formatted DVD-RAM; For MAC/PC compatibility, see SESSION.04 'Disk Format' (p.35), and 'Tutorial: disks' (p.41).

07 Burn Mode

Burn Only Burn+Check (Check Only)

Checking a DVD takes just as much time as burning it.

08 FilesToCopy

Unarchived All

The default is 'All'. Select 'Unarchived' before starting a CD/DVD mid-day copy, this causes the software to look at the 'Archived' flag on the files. Previously copied/archived files flagged as such will not be copied again. 'All' is used to make a second batch of DVDs carrying all files, previously saved or not.

09 File Name

FiletagOnly With Sc/Tk

FileTag only: BA1234_1.wav.
With Sc/Tk: BA1234==123A 12R w14==_1.wav,
this brings the scene and take to the editor's desktop.

- Backuping on CD/DVD, select 'With Sc/Tk' since long filenames are supported by ISO and UDF1.5 formats.
- Backuping on an external HDD, the filenames are forced to 'FiletagOnly' since long filenames are not supported by the basic FAT32 disk format.

Majax (Win-XP or Mac OS-X) extracts the Sc/Tk from the metadata contained in the iXML and can add them to the files en route to the post-chain on FAT32 formatted HDDs.

10 Media Label

CD 1 of 2

The number of disks needed for the backup is displayed. Press [ok], select the one to burn. [shift] [eye] displays the Media Label created for the disk. CD_MXD_2/5 means: CD-R – Mixdown (Xa · Xb) – Disk #2 in a 5 disk group. The remaining data volume to be burned is displayed.

The large file case

The length of a take can make it impossible to copy it entirely onto one CD. For instance if a 200MB long file comes in with its five brothers (a six track take), a 1.2GB CD is required. In this case, Cantar separates the take into its individual tracks while minimizing the number of CDs (or DVDs). The label becomes CD_2_D072, where [CD] is the media; [_2] the track #; and [D072] the last four characters of the filename.

Example of a CD/DVD label

An ISO volume label is limited to 31 characters

Cantar#	Project	Date	Archiv	Tag type 1 or 2
099	AAAAAAAA	YYYYMMDD	*	CD_T1-6_001

The archive flag (*) is either a (sp) space or a (#) to show if only not yet archived files have been burned; a way to know why some files are missing in the media (probably burned on another one).

Tag type1: CD_T1-6_001 general mode for DVD burning. T1-6: six mono tracks from AAD folder, T1-8: eight mono tracks from AAD folder. MXDN: monophonic stereo mixdown from AAD folder. MXBN: poly stereo mixdown from AAX folder. MXBC: poly stereo mixdown with 24-bit to 16-bit reduc. 001 to 999 (media rank).
Tag type2: CD_TK-1_001 used if the files must be separated because their group is too large to be burned on a single 690MB CD. TK-1 is the track number and 001 the media name rank.

11 Snap Report

None Direct Native Rotate miXdown

Snap immediately stores the day's Sound-Report into a YYYYMMDD.AA§ folder (§= 'Dir', 'Nat', 'Rot' or 'miX') on the drive(s) in use. (see 'Sound-Report - Delivery', p.37).

12 Idle Report

No Yes

Before [eject]-ing the DVD-RAM or *removing* the external HDD, select '**Yes**' and [ok]. This copies the Sound-Report to a YYYYMMDD.AA§ folder (§= 'Dir', 'Nat', 'Rot' or 'miX') which carries the same status as the files recorded on the backup disk (see 'Sound-Report - Delivery', p.37).

13 Clean Polys

No Yes

This operation deletes all of the previous day's Poly files resulting from intermediary treatments stored in the internal HDD. Obviously if you later have to deliver another backup copy containing Poly files, the Backup@Call will take longer since it will have to recreate the deleted files. As a precaution, only the Poly files of preceding workdays can be deleted.

14 Run Backup

No, nnnnMB Yes, nnnnMB

The default is 'No' with the size of the files to be saved. This allows you to quickly visit and immediately leave using the same [ok] button. RunBackup automatically inserts a Sound-Report carrying the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. The Sound-Report builder adds about one minute to the backup process; three forms are produced: a PDF file; a tab delimited CSV file for spreadsheet applications; an ALE list for editing machines.

```
BACKUP    14
Run Backup
Yes  360MB <
```

Example of a standard backup

Select '**T1-T8 (7/8)**' in.03, '**mono-Direct**' in .04, '**Poly16Trunc**' in .05, '**Ext.HDD**' or '**DVD-RAM**' in .06; you get a Poly16-bit mixdown plus all the native 24-bit monophonic tracks on an external HDD or DVD-RAM.

The several disk case

Go to BACKUP.10 'Media Label', select the disk you wish to burn, [ok], BACKUP.14 'Run Backup', [ok], 'Yes', [ok]. Go back to 'Media Label', choose the next one and so on. You can interrupt the process between two disks and return to it later. Don't forget to write Cantar ID, Project name, Date, and Media label onto the CD/DVD as it comes out, so as not to waste time looking for the ones you haven't done yet! Upon completion of writing, the disk will need to be manually ejected. When the green indicator starts blinking, press the burner's [eject] button.

Direct backup from a Mac or PC

Once TECHSET.01 'Disk Status' has '**Unmount**'-ed, the internal HDD is no longer under the Cantar CPU's control but is still powered; a Firewire connected MAC or PC sees the Cantar HDD as any other HDD, and can copy the files, perform selective erasure, and edit the metadata with Majax.
Warning: To prevent destruction of the Firewire input (max: 16.6 V) by the Mac GX (33 V), open the disk compartment, disconnect the HDD and connect it to the GX; its Firewire input handles up to 40 V. (Mac/PC laptops supply a safe 12 V).

Corrupted File Retrieval

Cantar saves the disc's FAT every ten seconds but in case of power interruption, the last file is left open and unplayable. Also, if by accident, you erase important file(s), do NOT continue to use the HDD. IMMEDIATELY remove it and send it to Aaton. Do not use any standard recovery programs, this is guaranteed to DESTROY any audio that could have been otherwise saved.

Hard Disk Drives

Internal The Cantar HDD is a PATA/IDE 2.5", 80GB longitudinal magnetization disk running at a low 5400rpm for minimum power consumption and heat generation.
If you replace it with a larger or faster one, be sure it doesn't get hotter, and verify that the static electricity grounding path between the disk housing and the Cantar chassis is still within factory specs (120k ohm, ±20k ohm).

External When selecting an external drive, the tendency is to choose larger vertical magnetization 160GB/250GB disks. But if the FAT32 can handle up to 2TB, MS lets it be 'universal' below 127GB only. To get access to the full disk capacity under FAT32, you must use *Partition-Magic* http://www.symantec.com/norton/products/overview.jsp?pcid=sp&pvid=pm80 and make **one primary** partition, not logical partitions.

Note: hot HDDs can become temperamental and trigger 'Bus Hangs'; it is preferred that you use a ventilated Firewire enclosure, such as the G-Drive http://www.g-technology.com/Products/G-DRIVE-mini.cfm If you suffer from connection problems with **LaCie Drives,** download the latest firmware from http://www.lacie.com/us/support/drivers/driver.htm?id=10053

Solid State Drives

Less than half the power consumption of rotating HDDs, SSDs are a must below -15°C, higher than 5,000m altitude and very bumpy environments. The currently available *Samsung* 32GB PATA MCAQE32G5APP-0XA and *Stec* ZEUS PATA 64GB 2.5" are compatible with Cantar's Firewire-to-PATA/IDE bridge, see pic.above. Because they feature a built-in 'wear leveling' function which spreads the workload to all memory cells (insuring the front cells are not always under fire), SSDs are much more reliable than CF cards which can't survive the many read/write cycles that audio recording requires.

Compact Flash cards

Abandoned by digital cameras in favor of the less fragile SD cards, CFs are on their way out. If you must use them, connect a Sandisk SDDRX4-CF-901 to the Cantar FW socket. Format them as FAT32 using Windows XP or Vista.

CD/DVD Burners

CD/DVD burners such as LiteOn tray SW431/ SW852S, Pioneer tray DVRK14, NEC tray ND6500A (good burner, but only accepts hard to find 8x DVDs) should be replaced with the Panasonic-Matshita slot UJ-85J or UJ875 which burn DVD-RAM and accept the latest 16x DVD±R.

Internal To install or replace an internal CD/DVD burner, see p.5. When Cantar abruptly goes to REC, the DVD-RAM burner closes its unfinished idle-copy task and generates magnetic interference for a few seconds. That is why it must carry an Aaton mu-metal shield plate (p.50).

Note: Setting TECHSET.01 'Disk Status' to '**Unmount**' opens access to the Cantar DVD-RAM burner through the Firewire socket; this is quite useful to edit metadata with a Mac.

External Cantar determines whether an external burner is Firewire connected, if it contains a blank disk and if the internal burner is empty, it will choose the external burner to run the backup.

CD/DVD Disks *never use supermarket branded media*

CD-R Made by Taiyo Yuden, Maxell 'Pros' are the best.
DVD±R Ask the Post Production supervisor what is his preferred flavor (+ or –). Taiyo Yuden 8x are the best but difficult to find; to print labels, use their "Watershield" disks, they are more water resistant than normal white printables. Cantar burns all DVDs at 4x to improve their lifespan.
DVD-RAM Panasonic 3x LM-AF-120LE.

CD/DVD Disk Handling

98% of all media failures are caused by poor handling. A dirty DVD can still be played, but if it has nothing more than fingerprints, it is unuseable for recording. Open your thumb and index-finger in a U-shape and hold the blank disk by its opposite edges. Do NOT clean an optical disk with a cloth in a rotary motion (best way to destroy a complete track) but by successive radial strokes.

DVD-RAM & the MAC *(see Majax Q/A p.49)*

DVD-RAM disks are read-only on Macs, this prevents modification of the file's metadata. To compensate for this infirmity, install '**WriteUDF**' http://www.softarch.com and replace the Mac 'super-drive' by a Matshita UJ-8xx, or buy a Panasonic standalone burner. Or use the Cantar DVD-RAM burner in its TECHSET.01 'Disk Status', '**Unmount**'-ed state.

Note: SATA-IDE HDDs & SSDs will be available by Sept. 2008 with the Aaton made Firewire-to-SATA bridge.

Example 1: Surround 5.1 (double M/S)

When using SoundField or Schoeps mics, there is no need for a special decoder; Cantar has it all, built-in!

Microphone wiring

With the Schoeps double M/S (L-C-R-SL-SR) head made of two cardioid and one figure-of-eight microphones, a decoding accessory is not needed. Schoeps delivers an XLR 7 extension cable to which a home-made XLR 7 to XLR 5/XLR 3 Y cable should be connected.

- ***XLR 7***(F) 1 = gnd 2 = +Mfront 3 = –Mfront 4 = +Sfront 5 = –Sfront 6 = +Mrear 7 = –Mrear
- ***XLR 5***(M) 1 = gnd 2 = +Mfront 3 = –Mfront 4=+Sfront 5 = –Sfront (yellow, red labels)
- ***XLR 3***(M) 1 = gnd 2 = +Mrear 3 = –Mrear (grey)

Track routing

The ***XLR 5*** goes to Mic 3/4 inputs routed to Track 3 and Track 4 which should be M/S declared; the output is automatically left/right decoded for monitoring. The Track 3 and Track 4 mixer faders being at 100%, the front stereo is heard.

The ***XLR 3*** goes to the Mic 5 input routed to T5; the pan-pot for this track should be put in central position (mono listening). The T3 mixer fader being at 0% and the T5 mixer fader at 100%, the monitor output becomes the sum of the S figure-of-eight mic on Track 4 (a+ a–) and the M rear mic on Track 5, the rear stereo is heard. It is thus easy to alternately listen to the front or rear M/S; or both with 5.1 double capsule headphones.

Mixing stage

Launch Pyramix and make two M/S strips, one for the front, one for the rear: lay down the three track media on the M/S Tracks (the Pyramix CW center width), copy Track 2 «S front» onto Track 4, which becomes «S rear». Reinject the M front onto the surround of the M/S front. You can also make an extraction for the 'sub': here is your 5.1 sound!

This is a proposition of Francois Musy and Gabriel Hafner, NSM Switzerland.

Example 2: B-Format

Cantar is the only on-location digital recorder allowing the STEREO monitoring of the 'complete' Soundfield B-Format (which includes 5.1) with no extra accessories. Thanks to its on-board mixer sliders, it is easy to monitor in STEREO while dynamically adjusting the 'space' parameters: pattern, width, rotation. Since the gain of the preamplifiers (Mic or Line level) can be ganged to one master fader only and monitored to the half dB, Cantar insures total control over the B-format later treatments.

Example 3: Over the shoulder M/S and mix

The boom on Mic 5 routed to Track 1 (the Mic 5 fader is the one which naturally falls under the right hand), the 'calm' RF mic on Line-in 1 routed to Track 2: you get the boom and the calm RF mic on the left circular screen. The 'active' RF mics on Mic 1 and Mic 2 are under the control of the two front faders; routed to T3 T4 they are together displayed on the middle circular screen. The stereo pair connected to the coupled Mic 3/4 inputs (only one XLR 5 to XLR 5 cable) are routed to T5 T6 and displayed on the right circular screen; they momentanily let you replace them ([eye] button) with the T7 T8 tracks which carry the mixdown.

Boom	>	Mic 5	> T1
RF mic, calm	>	Lin 1	> T2
RF1 active	>	Mic 1	> T3
RF2 active	>	Mic 2	> T4
Stereo-L or M	>	Mic 3	> T5
Stéreo-R or S	>	Mic 4	> T6

Example 4: Mixdown as 'reference audio'

The guide mix

The mixer faders and pan-pots feed the mixdown (Xa/Xb) tracks. The inputs are routed to the six tracks; an M/S couple is connected to prefaders 3&4 and routed to Track 5 and Track 6, M/S declared. The M and S signals are recorded as metered on the T5 T6 modulometers and stereo decoded into the mix-down output. If the editor prefers not to get stereo signals in his reference sound, pan the M Track to one side or the other, and the S Track disappears from the mix.

The boom and RF mics

Boom is connected to Mic 5 routed to Track 5. Track 5 is disarmed (if you don't want to record it), pan-potted to the left it goes to Xa (Track 7). The RF mics, routed to Tracks T1, T2, T3, T4 & T6 and all pan-potted to the right, go to Xb (Track 8).

Cantar & video cameras

Practice 1: Real-time Audio-TC in both machines.

The best method to sync Cantar to any video camera is to install a small LTC generator, such as an Aaton GMT, on the camera. A less desirable alternative is to use an RF link to send LTC from the camera to Cantar, which is slaved in External Clock mode.

The GMT timecode is recorded on one of the camera's audio tracks; don't forget to turn 'OFF' the automatic-gain and any other audio processing. This LTC is later extracted by the Avid composer (Avid XpressPro v5.7 or later) or FCP (with VideoShed AUX-TC-FCP) which correlate the continuous record-run Video-TC of the camera with this discontinuous free-run Audio-TC (see pic.). Thanks to their common audio timecode, the Avid/FCP can 'autosync' the Cantar audio files to the Audio-TC indexed images. This method is the one used for syncing telecine transfered AatonCode films. Please read the Avid 'autosync' instructions about the track VA1A2 rules in 'The PostChain' document (p.49).

Compared to the radio transmission of record-run TC plus TC break detection by Cantar, **real-time syncing** has two advantages: it works in multicamera shooting, and it is low power and fail safe. Compared to the *'free-run discontinuous Audio-TC as Video-LTC reference'*, it has the superiority to let each video camera use its own record-run continuous Video-TC, something much appreciated by video-post facilities.

Practice 2: Video-TC in both machines, DayStamp used as TapeRef (Reel ID)

How do you auto-conform the Cantar original audio files if the Avid editor only works from the videotapes carrying the mixdown sent to the video camera?

There is neither a filetag to ensure a link between the original tracks and the EDL reference nor a usable date in the user-bits; so every day the same indistinguishable Video-TC appears in the audio files. The only way to conform the original audio files to the EDL is to either insert the VideoTapeID in the audio files (the old method which no longer works, see 'A demand to be resisted' below), or to use the **day** (like on AatonCoded shots) by another means than the userbits: that is the **DayStamp**. Give special attention to the difference between the Cantar 'AudioTapeRef' which stores the DayStamp into each and every audio file, and the 'VideoTapeID' label which is not recorded on the

video media but entered by the assistant-editor during the image import. Here is how it works:

- Using the 'workday' rule which organizes the audio folders, Cantar stores the 'Month-Day' DayStamp into the 'AudioTapeRef' iXML metadata. Alternately you can overwrite the Cantar 'Month-Day' with the 'Day Rank', e.g. day one D001, day sixty two D062 (see PPR).
- The video camera operator writes the "Month-Day + Camera ID + Cassette number" on the videotape box for the digitizing assistant-editor to later key-in the six character 'TapeID' column of the Avid NLE.

April 18, camera-A, cassette 9 = 0418A9
April 18, camera-B, cassette 2 = 0418B2.

The (1 to 9 then A to Z) last character can identify 35 cassettes per day per camera... a very long workday!!

- To perform the auto-conforming of the original Cantar files, Titan-3 first sorts them by comparing the leading four characters (0418 or D062) of the Avid EDL 'VideoTapeID' column with the 'AudioTapeRef' found in the audio file iXML metadata, then it uses the timecode in- and out-points to finish the job.

The TC can be free-run or record-run, provided Cantar and cameras share the same time.

A demand to be resisted

The confusion between 'AudioTapeRef' and 'VideoTapeID' induces editors to ask sound recordists to enter the camera/cassette IDs in the 'AudioTapeRef' field; this is not good: 1- quite often the sound recordist is warned too late of the camera cassette change-over, 2- in a multi camera shoot, there is no provision to enter double or triple camera cassette IDs into the metadata, 3- how on a film stage could you enter the video cassette ID of a transfer to be performed the day after?

Nevertheless, if you have to replace the default MMDD DayStamp with a TapeRef, do it either in Cantar (this is the field following 'comments') or with Majax by highlighting the concerned files and batch modifying the 'AudioTapeRef' field. This insures that whatever happens to your files, e.g. mono to poly conversion, mixdown, gathering in a different folder, copy to DVD, flying through the internet..., they will forever carry your given reference.

Tutorial 4. "Rec&Play"

Rec&Play plays up to six play-tracks from the internal or external HDD while recording a selection of these play-tracks (re-entered thru the Digi-inputs) along with the 'live' audio coming from the analog inputs. To activate the Rec&Play functions, press the blue [shift] button while transitioning to a new [MainSelector] position, and hold it for one second after the '***blue position***' has been reached.

Live temporality

BLUE-BRWS.21, p.24

Choose 'Live', the continuous timecode, scene, take, comments and track-names are from the new take. At each call of a *play-card* (a playback file segment), Cantar generates a *Linking-Trio* which stores the filetag and timecode of the playback file into the new take's file. (see note)

• **Classic playback** Audio tracks such as telephone calls, background music and wild sounds are played and recorded during a live recording. Thanks to its zero delay audio triggering and the sub-frame postsyncing precision brought by the Linking-Trios, Rec&Play makes external players and 'MusicSlates' obsolete accessories.

• **ADR (type1)** The actor records his replacement dialog right after listening to a play-card opened then closed on its cue-points (each play-card can be played again and again to satisfaction).

Note: the Linking-Trios are made of two TCs and the playback file's filetag. They are stored in the iXML chunk of the live file; readable on the CSV Sound-Report, they are used to resync the original playback tracks with the edited audio tracks with sub-frame accuracy; a message 'PB filetag AB1234, XY9753' in the comment line, makes it easier for the editor/final mixer to find the original playback files by running a filetag search on his computer.

Clone temporality

BLUE-BRWS.21, p.24

Each time a clone of the master is recorded, it carries the same timecode, scene, take and comments as the master *but with a new filetag*, you will never run the risk of erasing a master or the clone of a clone.

• **Remix** To redo the mixdown of a take, route the master's six tracks to the clone's six tracks and the mixer output to the T7 T8 tracks. You get an exact copy of the master's iso tracks, with a new mixdown made under the control of the on-board mixer.

To add a simultaneous translation of a foreign language dialog, you can either route two master's tracks to the same clone track and route the translation mic to the freed track, or select 'Mic & Xb' as the new mixdown.

• **ADR (type2)** *While listening to* some master play-tracks used as guides, and watching the video images of the original shoot, the performers re-record their dialog on a new set of tracks. The timecode of the master play-file feeds the LTC-out generator, which can be used to sync a chasing VTR.

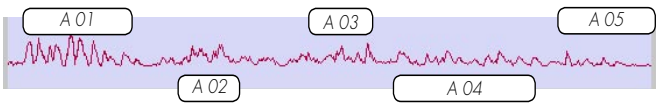
• **Re-recording** Cantar's ultra-short 0.4msec 'Mic to Headphone' latency makes it an ideal tool for incremental recording. After a track recording session, put your best performed file (not always the last one) into the 'to be cloned' index, then proceed to the next track recording... until you get an eight track file group containing seven iso tracks plus a mono-mixdown (p.22).

Preparation

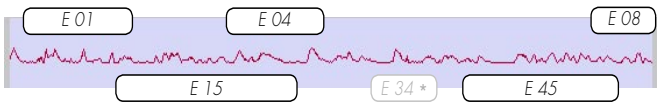
Cantar-X1 & X2

BLUE-BRWS p.24. Select files from the current project and archives to index them as ready-to-use ***play-files*** (A to L).

BLUE-PLAY p.23. Place cue-in and cue-out points to create segments called ***play-cards*** (up to fifty-one per file).



Play-file 'A' from the current project containing five play-cards. Note their chronological placement suited to an 'ADR' work.



Play-file 'E' from the archives, six play-cards (E34 hidden). Note their free and overlaping placement suited for playback

Under fire

BLUE-BRWS p.24. Select a Temporality and an Index.

BLUE-TEST p.17. Choose the IN-GRID to the recording tracks and the OUT-MAPS to the monitor outputs. Adjust the levels of the live analog vs the playback digital inputs.

Simulate/rehearse the recording session: *Simple sequence* (e.g. ADR type1), jump from play-card to play-card with [>]. *Complex sequence* (e.g. classic playback), select the play-cards by entering their IDs (e.g. B14, F32) using an attached keyboard.

BLUE-REC p.22. *Cantar-X2 only*

The Cantar mirror

Through the *Cantar-X2* Ethernet connection, Tarkan controls Cantar's system configuration, creates on-line and off-line* user setups, and edits all of the metadata stored in the recorder. It works on 1024x768 or higher resolution screens.

Installation: Download the correct version from the Cantar software site (see p.3) to a PC (Win-XP) or Mac (OS-X).

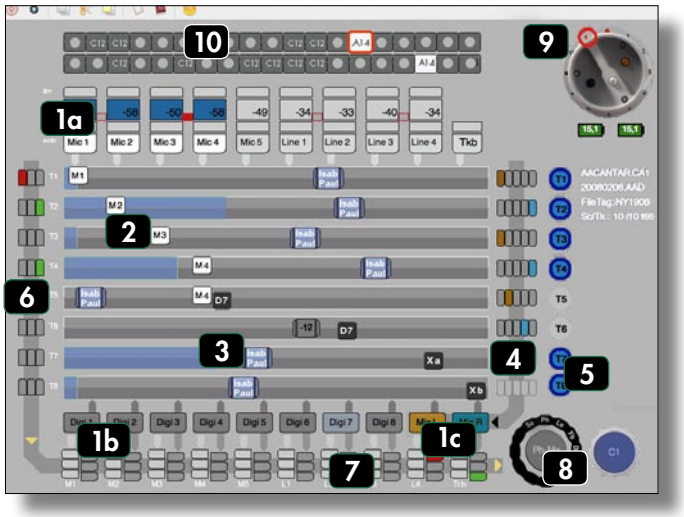
Cantar Connection RJ45 socket on the HDD compartment housing, make sure the Ethernet cable is tightly held by the canyon shaped clamp.

Laptop Connection turn off the WiFi to stop any other TCP/IP activity; eliminate the firewall*. Connect the Cantar Ethernet cable to the RJ45 port. Launch Tarkan and wait (Win-XP: 60 sec, Mac OS-X: 10 sec) before clicking the upper/left 'start' icon which lets the Tarkan server assign an IP address to the connected Cantars (up to ten).

1 'Routes'

Tarkan is unique in that the 'Routes' screen displays the audio flow, including the mixer's faders and pan-pots, in one glimpse. The mic/line inputs settings appear on this screen too.

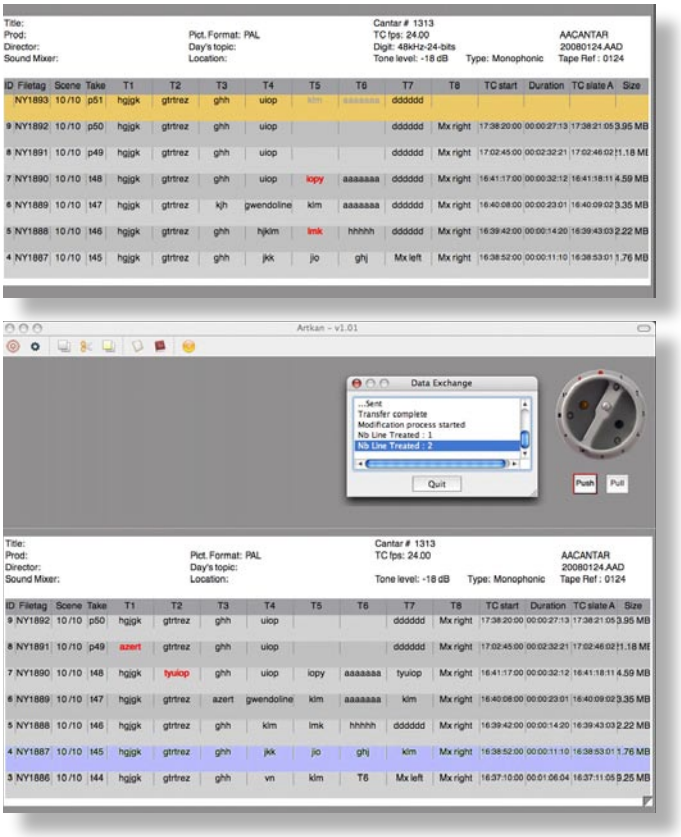
The analog inputs (1a) go down, the digital inputs (1b) go up to the track cross points (2). The mix faders (3) (carrying the



track-names) and the modulometers fly over the tracks going to the pan-pots (4) generating the mixdown input (1c); Armed tracks (5) (deep blue circled) go to the disks and also to the 'Left-Center-Right' *track monitoring* switches (6). Analog and digital inputs go directly to the "*input monitoring*" switches (7). Both (6) and (7) go to the monitoring crown (8). With Cantar's [MainSelector] set to PPR, clicking on any position (yellow circled) of Tarkan's virtual selector (9) changes Cantar's function to what is clicked (becomes red circled). The Rec&Play panel (10) is used to select and activate the play-cards.

2 'Metadata'

For paradigm consistency, metadata are presented in the same lay-out as the Cantar Sound-Report; they are either immediately written in the open audio files (REC: yellow background, PPR: orange), or stored if the files are closed or inaccessible** (red characters on grey background), waiting to be 'pushed' to the connected Cantar in physical



or virtual BROWSE positions.

Toggling between 'Routes' and 'Metadata' screens is allowed on the positions where the MainSelector becomes dark grey; double click on the selector itself.

3 'Operands'

This screen has not yet been released, it displays the AUDIO/TC, TECHSET, SESSION and BACKUP parameters, and handles the 'Save Setup', the off-line** 'Create Setup' and the 'Load Setup' operations.

** Consult the OS manual, procedure is different between MacOS 10.4 and 10.5.*

*** Tarkan laptop in standalone mode, disconnected from Cantar (March 2008).*

Connections

If the Cantar motherboard is CM2.6+ (the ID appears under the white sheet in the HDD housing), the CantaRem to Cantar ASCII connection is insured through the Cantar's SubD15 pin-2. Use a 'SubD15 to Lemo8' cable (ref. 594 4090).

If the motherboard is earlier than CM2.6, the SubD15 pin-2 is not internally connected to the ASCII port. Use a 'SubD15 to Lemo 8+Lemo 5' Y cable (ref. 594 4191), and connect the Lemo 5 to the Cantar timecode-in socket.

• To gang two CantaRems, use the Fischer4-Lemo8 cable (ref. 594 4092). The Fischer4 plug goes to the first CantaRem, the Lemo8 plug goes to the second one.

A	Lemo 5	ASCII – LTC In/Out
B	USB	PS2 keyboard
C	Fischer 4	PDA power (or CantaRem '1' to '2')
D	Lemo 8	Connection to Cantar (or CantaRem '2' to '1')

• The CantaRem USB socket (max: 80mA, +5V) can't power a PDA; it is made to feed a PS2 keyboard only. But you can use the +12V delivered by the Fischer4 socket, terminate the PDA car-lighter +12V to +5V voltage converter cable with a Fischer4 plug (pin-1: Gnd, pin-4: +12V).

Sliders' assignment

• Set AUDIO/TC.23 'CantaRemCom' to '**Active**'. Press one of the CantaRem [ctrl] keys, '***Assign***' appears on the top row of the Cantar rectangular screen. Press and hold a slider key (1 to 8), the slider number is displayed on the middle row.

Note: if AUDIO/TC.23 is set to '**Inactive**' AUDIO/TC.24 - 38 will not be accessible. If you want to modify those settings before hand, set AUDIO/TC.23 to 'Active'.

[jog] or [>] to browse the Cantar faders which successively show on the bottom row: **Unused, Mic-1, Mic-2, Mic-3, Mic-4, Mic-5, Line-1, Line-2, Line-3, Line-4, Line-1&2, Line-3&4, Track-1, Track-2, Track-3, Track-4, Track-5, Track-6, Line-out, Foldback.** The assigned fader is the one displayed while releasing the key.

• The new assignment of a CantaRem slider already linked to another Cantar fader cancels the former link. All Cantar faders are re-enabled as soon as CantaRem is disabled by setting AUDIO/TC.23 'CantaRemCom' to '**Inactive**', or by unplugging the cable. Stored assignments are displayed on AUDIO/TC.24 to 31.

• To control several mic input faders from the same actuator, couple them in the usual Cantar way and assign the actuator to the master only. The slaved rotary faders are used for the 'balance'.

• Press a slider key to activate the solo monitoring of the Mic, Line-in or Track fader under its control.

• The 0.6 second latency of Cantar's Line-in faders is more apparent when they are driven by linear actuators which, unlike the Cantar on-board faders, can be swept from 0 to -60dBFS in a wink.

• Put Cantar on STOP to initialize its clock by ASCII from an OriginC.

• Cantar remote: [MainSelector] on PPR, set AUDIO/TC.23 'CantaRemCom' to '**Active**'. Press both [ctrl] keys, and press [2]: TEST, [3]: PPR or [4]: REC. When 'Canta RemCom' is set to '**Forced**', [1]: STOP is also available.

Design considerations

• Since Cantar is the only audio recorder featuring a wireless PDA link, there is no need for a 'replica' display nor a built-in keyboard on CantaRem.

• CantaRem's Penny+Gilles faders are feather-smooth, but not as resistant to the elements as Cantar's magnetically driven faders. That is why CantaRem is built with structural transparency, allowing sand and water to freely flow through.

• The precise gain value of each fader is displayed on Cantar's rectangular screen, the actuators' 0 to 9 scale is only a quick positioning aid.

Functions

• Remotely controls Bluetooth equipped Cantars in TEST, PPR and REC • Sets input and output routings • Displays modulometers and fader gains • Edits scene, take, comments and track-names.

R·can-w runs under Windows Mobile 5, not Mobile 6.

Note: R·can-p for Palm-OS is no longer maintained, e.g. the remote-record function has not, nor will it be, implemented in this application.

Installation

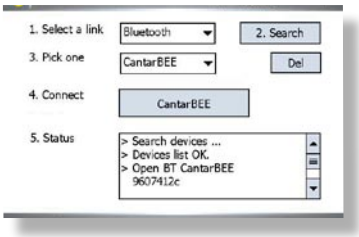
The Win-Mobile 5 PDA must feature a VGA screen (640x480), not a QVGA screen (320x240), and an MS Bluetooth stack, not a Broadcom stack, *e.g. Qtek 9000, iMATE Jasjar, DELL Axim-51v; HTC X7500 / T-Mobile Ameo.*

Download '**rcan-xxx.cab**' from the Aaton web site to a PC or Mac and copy it through USB into a folder of the PDA. Then open this folder and execute 'rcan-xxx.cab'.

Connection to Cantar

Cantar side Set TECHSET.14 'Serial Com' to '**Bluetooth**'. The 3m range Cantar transmitter is low power (Idle: 0.1mA, Connecting: 4mA) and may remain active at all times.

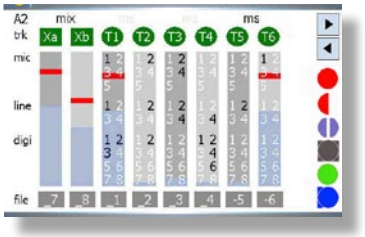
PDA side Click R.can's icon in the PDA 'programs' screen.



1. **Select a Link:** Bluetooth.
2. **Search:** found Bluetooth devices are shown in the '**Pick one**' pulldown menu; click the ID for the Cantar you want to store in the PDA memory.
3. **Pick one:** the list of Cantar IDs in memory is shown; click the desired one.
4. **Connect:** the latest Cantar ID will show at next connection.
5. **Status:** for maintenance engineers.

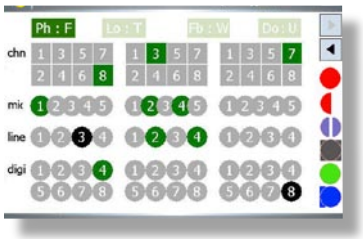
Working Screens

R.can-w displays the modulometers, prefader and mixer gains, plus the mic-preamp settings. It sets the ins and outs routings, and enters/edits scene, take, track-names and comments.



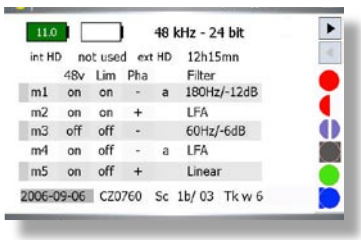
1 Inputs grids

track (dis)-arming (file rank becomes light grey), M/S status, inputs to tracks routings can be modified in STOP position.



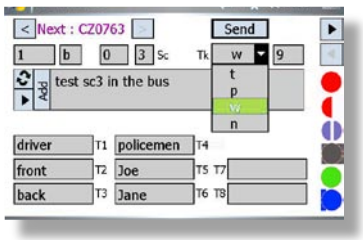
2 Outputs maps

recorded signals appear in green; the non-recorded, sent directly to outputs, appear in black. Outputs mapping can be modified in STOP position.



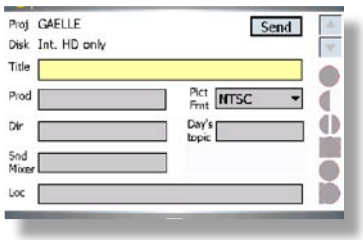
3 Physical parameters

top: battery voltage, sample rate and bit-depth, internal/external disk recording time. *middle:* phantom, limiter, phase, high-pass filter in STOP position. Prefader/mixer gains in TEST PPR REC. *bottom:* filetags, scene, take, day and time.



4 Metadata editing

Scene, take, comments, and track-names with auto completion, and memorized text insertion, are edited in REC PPR and BROWSE.



5 Sound-Report editing

R.can-w is a great helper to enter and modify the Sound-Report's headers. Several entries per day are allowed. A new .ALE page, a new .CSV page and a new Sound-Report page is opened anytime a header item is changed.

See the complete R.can-w user's instructions on http://www.aaton.com/products/sound/arcan/index.php

OriginC master-clock sets cameras and recorders TC

Start OriginC by pressing the [#] key. Enter *all of* the Prod ID digits, Date and Time. Press [#] to scan through the display. All fields being set, press [*] to start the clock. To shut-down, press [#] for five seconds until '**Stopped**' appears.

To ASCII initialize Cantar, cameras or other machines with ASCII (an fps agnostic protocol), plug the Lemo 5 into the LTC socket of the machine, press [#]. OriginC's answer back should be '**good 00.0**'.

To ASCII check if a camera clock is within drift limits, connect it to OriginC once in a while, press [#]. OriginC displays '**good**' '**fair**' '**bad**' or '**diff-time**', followed by the amount of drift in frame tenths.

To LTC init a machine with SMPTE LTC, simultaneously press [#] [0].

To get or check LTC generated by a IVS-TC, Fostex PD6, etc. or to simply read external timecode, press [*] [2].

To send continuous LTC to a non-TC recorder, press [*] [1], OriginC generates a SMPTE LTC signal to be recorded on an unused audio track.

To select 24, 25, 30fps SMPTE LTC out, press [*] [4], then [#] to confirm.

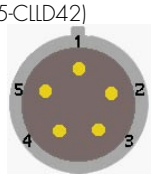
Technical Specifications

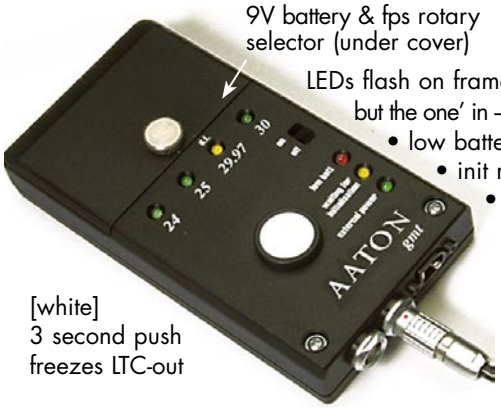
• 1 ppm TCXO ±1/2 frame shift after four hours • Six hour automatic-shutoff • 150 hours on a Li-Ion 9V battery. • 180x90x20mm. 375gr.

Order an Aaton L5-XLR3-SCH cable for connection to the recorder's LTC socket.

Lemo 5 plug (ref: PHG OB-305-CLLD42)

1-Gnd 2-LTC out
3-ASCII in/out
4-NC 5-LTC in





GMT is a 1 ppm low-power LTC generator for SD or HD cameras, audio recorders and digi-slates.

• **GMT** is momentarily initialized from an ASCII master-clock or another LTC source, whatever its normalized frame-rate.

Permanently installed on a video camera, its (internally adjustable) line-level LTC-out is recorded on an audio track of the camera; this bonds the record-run Video-TC of the camera to the free-run Audio-TC which is also running in the other machines on the set. During image digitization, the NLE will read the Audio-TC and «autosync» images and BWF audio by this common TC. As opposed to Video-TC radio transmission from camera to recorder, this method works for multicamera shoots.

• **GMT** is also an emergency master-clock. Turn it 'On' then press the [white] button to initialize its clock from hour 01. The date generated by a new GMT starts at Y92/M01/D01, it is incremented by one day at each power 'On' followed by a [white] button initialization. The "Year/Month/Day" is stored in a non-volatile memory, resulting in a *never-twice-the-same date* from a given GMT.

GMT-u (NEW MODEL) remote record

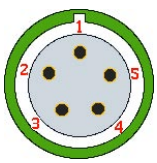
• Whatever the initialization mode, pressing the GMT-u [white] button for more than three seconds makes the LTC output freeze on the last TC value (the four frame-rate LEDs blink). A short push on the [white] button unfreezes the LTC. Sent by wire or radio, this signal stops and starts the Cantar recording (p.18).

GMT-u Technical Specifications

• 150 gr • 63x123x26mm • 9V battery (150 hours working) • 7 to 18 VDC ext. supply • 6mA consumption • 1 ppm clock • LTC-out: -20 to -60dBu & TTL • FPS selector: 1 = 24, 2 = 25, 3 = 29.97DF, 4 = 30 ; selected fps LED flashes. *5 = 23.98NDF [24 –0.1%], 6 = 29.97NDF [30 –0.1%]; three LEDs, other than the selected fps, flash.*

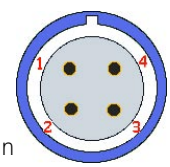
Lemo 5

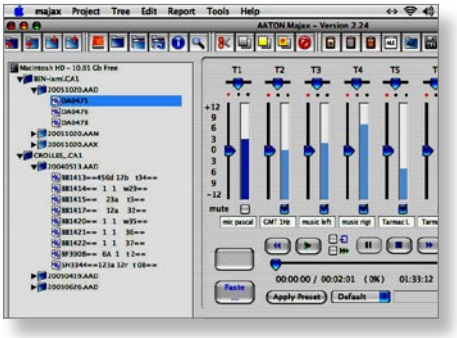
1-Gnd 2-LTC in
3-ASCII in/out
4-LTC out, adj. level
5-LTC out, TTL level



Fischer 4 (GMT-u only)

1-Gnd 2-[White] button
3-LTC out adj. 4-Power in
(Fischer 4 plug ref: S102A053130





Majax

An Aaton software package for Mac-OS and Windows 2K & XP, exclusively devoted to the treatment of Cantar files.

Plays ten tracks, edits metadata

• Through the laptop built-in audio card, Majax plays ten tracks with ±12dBu level and pan adjustments, with M/S to L/R decoding and solo listening.

• Majax edits the scene, take, track-names, DayStamp (audio tape reference) and recordist's comments within the BWF metadata iXML field.

• Clicking the 'Slate' or the 'UM' icon (left of the 'Slate' icon). sends the cursor to the Autoslate or operator entered marks.

• Majax mixes eight monophonic tracks into two, and interleaves them into polyphonic files.

Generates frame-accurate Sound-Reports

Gathering the iXML metadata generated by Cantar and the operator, Majax builds a Sound-Report with your edited metada entries. It is saved in PDF format to be printed and mailed to the Post Production team, and in Avid list format (.ALE) which can be opened by any spreadsheet application.

Q: How to get audio out of a Mac-Intel.

A: Go to Root disk –> Library –> Preferences in which you delete the file 'com.AATON.Majax.plist'.
If you re-open the menu in which you see 'Built-in Mic', immediately get out by 'Cancel'! Clicking [ok] would again corrupt the clean 'com.AATON.Majax.plist' that Majax just rebuilt after the deletion of the corrupted one.

Q: How to edit DVD-RAM discs with a Mac?

A: Apple is not DVD-RAM friendly! First install SoftArch 'WriteUDF' http://www.softarch.com then if you use a laptop equipped with an 'E' (economic) SuperDrive (sic), you must either discard it and install a genuine Matshita UJ 875, or connect a standalone DVD-RAM burner with patchburn http://www.patchburn.de or use the (TECHSET.01 'Unmount'-ed) Cantar internal burner.

IndawPass

Tell your Post Production manager that Aaton's IndawPass is the ***fastest Tape-to-Tape and Audio/Video Sync*** machine in the industry when it comes to syncing audio files to DPX, HD and SD images.

FPS agnostic

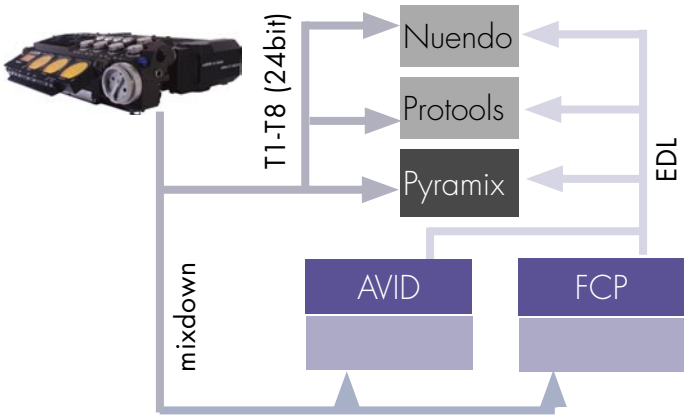
IndawPass solves all the problems Post Production facilities may encounter in the maze of audio-video-film speeds and standards.

Transfer-list cleaner

IndawPass also rejuvenates the ALE transfer lists sent to the Avid with better Keycode matching than the telecine originals.

The PostChain

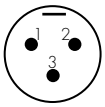
Read 'The PostChain' http://www.aaton.com/files/cantar-post-chain-22.pdf



Titan-3

For autoconforming with Titan-3 ***FlashConform*** and FixSync using the Cantar filetags, get the cantar.tsc rules from Synchro Arts http://www.synchroarts.com or send an email to aaton-support@aaton.com.
By their very nature the Aaton filetags eliminate all TC overlaps, and this is a huge advantage over all other references!
Note: Titan-3 does generate sample accurate audio conformation lists, provided the ***FixSync*** process is performed immediately after the EDL driven FlashConform operations.

Connectors



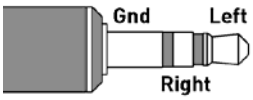
Mic-in XLR 3(F)
Symetrical, transformer (0dBu/+24dBu w/ pad)
Mic 1, Mic 2, Mic 5 on XLR 3:
1 = Gnd 2 = Hot 3 = Cold

Mic-in XLR 5(F)
Symetrical, transformer (0dBu/+24dBu w/ pad)
Mic 3 (Left or M): 1 = Gnd 2 = Hot 3 = Cold
Mic 4 (Right or S): 1 = Gnd 4 = Hot 5 = Cold

Line-in XLR 5(F)
Assymetrical (4.4k ohm, +10dBu)
Line-in 1 (3): 1 = Gnd 2 = Hot 3 = Cold
Line-in 2 (4): 1 = Gnd 4 = Hot 5 = Cold

Line-out XLR 5(M)
Symetrical, −10dBu out @ −18dBFS on track.
Note: HD camera Line-in practice is -20dBu, not 0dBu.
Line-out 1: (stereo Left)
1 = Gnd, 2 = Hot, 3 = Cold
Line-out 2: (stereo Right)
1 = Gnd, 4 = Hot, 5 = Cold

Foldback TA-3(M) Mini-XLR 3
1 = Gnd, 2 = Left, 3 = Right
(3.5mm Mini-jack socket on earlier Cantars)

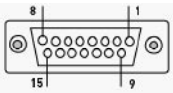


Phones 1/4" jack
8 ohm speakers up to 2Vrms

Timecode-in/out LEMO 5(F)
1 = Gnd 2 = LTC-In 3 = ASCII 4 = nc
5 = LTC-Out

Power XLR 4(M) (max: +16.6V)
1 = Gnd 3 = Li-Ion* 4 = NiMh or Li-Ion w/diode
*Cantars over # 268 directly receive Aaton R-Cell Li-Ion battery power through pin-3.

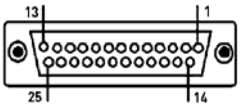
Remote & Sync SubD 15



1	2	3	4	5	6	7	8
GND	ASCII	LTC OUT	WORD CLK	RESERVED	RESERVED	RX	TX
9	10	11	12	13	14	15	
BATTERY+	LTC IN	REC TALLY	RESERVED	RESERVED	GND	GND	

2 ASCII-in with motherboard CM2.6+
3 LTC-Gen if 'On' in 'AUDIO/TC.16'
4 Wordclock Cantar-X2 only
9 Batt+ Out 13±3V, polyfused @250mA
11 Record Tally closure to ground (p.22)

AES-in/out SubD 25



AES inputs				AES outputs			
CHANNEL PAIR	HOT +	COLD -	GND	CHANNEL PAIR	HOT +	COLD -	GND
1-2	24	12	25	1-2	18	6	19
3-4	10	23	11	3-4	4	17	5
5-6	21	9	22	5-6	15	3	16
7-8	7	20	8	7-8	1	14	2

Accessories

Line-out Booster +12
Two 12dB gain transformers make the Line-out deliver 0dBu at -18dBFS track level (ref. 20-270-50).

Line-out Booster +12

USB-PS2 to SubD 15

USB-PS2 to SubD 15
Converter featuring a regulator (max 60mA, +5V), and an RS232 translator for PS2 keyboards w/ USB-like plug (ref. 59-681-91).
Only use a QWERTY US/English PS2 compliant keyboard such as the Cherry G84-4100 PTM EU.
http://www.cherry.de/english/advanced-line/advanced_g84-4100.htm

8to8 bridge (non SL1 equipped Cantar-X1)
Eight 26dBu /10k ohm transformer isolated balanced line inputs to Cantar mic & line inputs. See tutorials on
http://www.soft.aaton.com/swcantar

Internal DVD-RAM burner
Note the position of the loctite fastened mu-metal shield to be installed on a consumer DVD-RAM burner (p.41).